INDEX TO VOLUME II., 1935.

32

REFERENCES AND ABBREVIATIONS

search of a given subject will find it useful to bear in mind that the references are in several distributed under two or more separate but nearly synonymous headings. Institutions orporations with the right to the prefix Royal will be found under that prefix, with the on of Hospitals, which will be found under that heading; and Medical Societies, which parately indexed under Societies. All Universities are indexed under the word Uni- (A) = Annotation, (C) = Correspondence, (LA) = Leading Article, (ML) = Medico-legal, New Inventions, (O) = Obituary, (PI) = Parliamentary Intelligence, (R) = Review, (PCP) = Panel ntract Practice, and (P) = Prognosis Series.

rdance of page numbers and dates of issue will be found on page xxvi.

A

vitamin C subnutrition,
in, 1399
te," in children, 1370;
iography of (A) 202;
rceps for (A. K. Henry)
ain introducer (T. J. D.
254; Glénard's disease
all) 908; self-inflicted
C. Astreos) 191; tuber-
) 310; *see also* Ascitic
eral
rsity Club, London, 1095
ion (F. W. S. Browne.
i, and H. Roberts) 1446;
eign body in bladder and
e) 825; criminal, naturo-
) 1438; habitual, vita-
i4; in United States,
al mortality and (PI)
ccal infection and (P. M.
7, (LA) 1302
. Fracastor: Syphilis or
Disease (A) 89; T.A.B.
norrhœa (C) 802
eculiar bodily dispropor-
proctalgia fugax (C) 455
., Electrokinetic Pheno-

ulance service for (J. M.
A) 896, 956, 1037, 1153,
l services in, 922, (A) 956
ance Council (A) 317
ality of young adults
. petrol and explosives,
) 41; *see also* Electric
rial medicine, and Road

n paroxysmal tachycardia
house) 1291; *see also*
m
cid, *see* Aspirin
pyloric carcinoma and
C) 46
ice (A. M. Scott) 872

Acland, Sir F. Dyke, the dentist's mind and fingers, 856
Acromegaly, prognosis of (H. Cairns) (P) 1310
[illegible] tabilisation of
[illegible] (A) 1014
Adapter for catheter, 926
Addiction, *see* Dangerous drugs
Addison, C., on malnutrition (PI) 221
Adhesive strapping, *see* Skin
Administrators, medical, *see* Hospitals
Adolescence—hygiene of, lectures on, 914; psychoses of, 905; slimming problems in (R. Miller) 793; *see also* Puberty
Adrenal, *see* Suprarenal
Adventures with Animals and Men (C. Kearton) 172
Aerophagia, *see* Air-swallowing
Africa—ambulance air service in (A) 954; anthrax in Barotseland (F. W. Gilbert) 1283; blackwater fever in negro child (C. C. Chesterman) 554; cancer in Kenya natives (F. W. Vint) 628; Hodgkin's disease in Nigeria (E. C. Smith) 874, (A) 895; infibulation among Somalis (J. M. Melly) 1272; plague in, 1478; tsetse-fly control in (A) 437
Age, *see* Old age
Agranulocytosis—(C. R. Lane) 20, (B. J. Boulton) 610; agranulocytic anæmia (H. M. G. Foster and M. Douglas) 1461; amidopyrin and (A) 894, 1326, (A. B. Hansen and C. Holten) 1342, (R. F. L. Hewlett) 1347, 1351, 1481; meningitic symptoms and (Sir K. Goadby, C. Worster-Drought, and W. E. C. Dickson) 933
Ahlbom, H. E., Mucous and Salivary Gland Tumours (R) 1415
Air embolism (LA) 1417
Air Force, *see* Royal Air Force and Services
Air Hygiene Foundation of America, 1388
Air-passages, *see* Bronchi, Nose, and Throat
Air raids, *see* Poison gas
Air-swallowing—in infants (A) 1069; radiography of, 1498

Air transport—ambulance (A) 954; Australian aerial medical service, 964; first aid by parachute, 425; free falls, parachute jumps and (A) 1013; medical examination of fliers (A) 894; yellow fever and (A) 380
Aitken, R. S., hæmatemesis, surgery and (C) 973
Alastrim, pathology of, 1236, (A) 1305
"Albatross" (C. T. Fitzgerald) 172
Alcohol, *see* Motorists and Road accidents
Aldred-Brown, G. R. P., on plasma proteins and N.P.N. in rheumatism (A) 836
Aldrich-Blake scholarship, 1269
Alkalosis, treatment of peptic ulcer and (W. Oakley) 187, (G. Evans) (C) 582, (D. Hubble) (C) 634
Allchin, F. M., combined distance radiation of hypopharyngeal cancer, 652, (A) 675
Allen, C., medical psychology (C) 1328
Allen, W. M., corpus luteum hormone (C) 454, (A) 438
Allergy—adhesive strapping, dermatitis and (A) 382, (R. S. Woods) (C) 580, (A. D. Wright) (C) 580, (S. McAusland) (C) 635; amidopyrin and (A. B. Hansen and C. Holten) 1342; anaphylaxis and (A) 1419; bacterial allergy (A) 12[illegible]
asthma and ([illegible]
and (D. C. H[illegible]
and (J. T. In[illegible]
hay-fever (A) [illegible]
and (A) 624;
All-India Ophthalmological Society, 227
Aluminium cooking vessels (A) 954 (H. W. Elwell) (C) 1484
Amblyopia—Amblyopia Reader (M. Dobson) (LA) 378; quinine (S. Tibbles) (C) 1089
Ambulance service, *see* Abyssinia and Air transport
America—maternity hospitals in (K. V. Bailey) 1213; *see also* United States of America
American Medical Association—childless marriage (A) 1246; neurodermatoses (LA) 1063; pleural shock (LA) 1417; poliomyelitis (A) 1131

American Public Health Association, 1081
Amidopyrin, see Agranulocytosis
Amnesia—head injuries and (W. R. Russell) 762 ; psychogenic (A) 953
Amœbic dysentery, water-borne, 451
Amrein, O. (O) 403
[illegible] I. Holmes) 71,
(A. H. Imrie)
Blood (L. E. H. Whitby and C. J. C. Britton) (R) 669 ; hæmolytic (J. L. Lovibond) 1395, (A) 1423 ; multiple myeloma and (A) 836 ; reticulocyte reactions and (G. R. Minot and W. B. Castle) 319, (LA) 312 ; rheumatism and (D. H. Collins) 548 ; sternal biopsy and (A) 1306 ; see also [illegible]
Anæmia, [illegible] reac-
tions a[illegible] W. B.
Castle) [illegible] o and
(LA) 1127
Anæmia, splenic—splenic artery ligatured for (F. P. Connor) (C) 46
Anaerobic toxæmias in animals, 963
Anæsthesia—by closed method (T. A. B. Harris) 817 ; deaths from, trunk-leg ratio and (A. Piney) (C) 972, (A. Abrahams) (C) 1031 ; evipan sodium, premedication and (R. W. Nichol) (C) 861 ; explosions in operating theatres (Sir J. E. Petavel)(C) 1327, (J. Blomfield) (C) 1378 ; of animals (A) 436, (C. W. Hume) 1021, (LA) 1010, (PI) 1490 ; prize, 1148 ; surgical shock and, 1413 ; teaching of (A) 1069 ; Theory and Practice of Anæsthesia (M. D. Nosworthy) (R) 618 ; Trattato di Anestesia (A. M. Dogliotti) (R) 1062 ; see also Avertin, Childbirth, Cyclopropane, and Midwifery
Anæsthesia, local—basal narcosis and (A) 1015
Anæsthesia, spinal—anuria treated with (D. S. Hayes and R. H. Paramore) 554 ; percaine (A) 623
Anaphylaxis, Richet and (A) 1419
Anatomy—Anatomy of Leg and Foot (P. N. Vaus) 61 ; Anatomy of Nervous System (S. W. Ranson) (R) 1466 ; Anatomy : The Thorax (C. R. Whittaker) (R) 26 ; at St. Thomas's Hospital medical school (A) 1191 ; Beesley
Surgical
'almsley)
(J. W.
ingham's
y (J. C.
(R) 832 ;
Anatomy
(R) 890 ;
ton) (R)
an Ana-
lesson in
(A) 200 ;
of shoulder (L'épaule) (A. Basset and J. Mialaret) (R) 26
Anatomy, morbid, see Pathology
Anderson, E. M., Essentials of Light Treatment, for use of Masseuses, 1446
Anderson, G. E., and Eschweiler, P. C., Diet Control (R) 252
Anderson, J. (O) 453
Anderson, J. H., treatment of obesity, 604, 846
Androsterone, see Sex hormones
Aneurysms, surgical treatment of (W. H. C. Romanis) 1275
Angina, see Coronary thrombosis
Anglo-Scandinavian pilgrimage, 677
Animals—Adventures with Animals and Men (C. Kearton) 172 ; anaerobic toxæmias in, 963 ; anæsthesia of (A) 436, (C. W. Hume) 1021, (LA) 1010, (PI) 1490 ; Animal Year Book, 1447 ;
(LA) 1061 ;
(PI) 52 ;
Medicine,
H. Wool-
Animals
(R) 1241 ;
; see also
Bovine tuberculosis
Anonymous letters (A) 1015
Anoxæmia—intravenous oxygen in (A) 380, (T. Lumsden) (C) 456 ; renal function and (R. A. McCance) 370
Anthrax—in France, 850 ; novarsenobenzene in (F. W. Gilbert) 1283 ; shaving brush and, 160
Anthropology—Head, Heart and Hands in Human Evolution (R. R. Marett) (R) 720
Antimony administration (F. G. Cawston) (C) 47
Antrum, maxillary—dental infection and (E. C. N. Strong and I. B. Barclay) 131
Ant-sting in nose (J. Wiltshire) (C) 344
Anuria, spinal anæsthesia for (D. S. Hayes and R. H. Paramore) 554
throm-
[illegible] (L) 577 ;
(C) 971
[illegible] r) 937 ;
Appointments, weekly lists of, 58, 113, 170, 231, 284, 351, 407, 464, 538, 588, 642, 696, 748, 810, 867, 924, 986, 1012, 1100, 1149, 1212, 1274, 1331, 1390, 1448, 1498
Arab medicine in Spain, 848
Arm—arterial embolism of (V. Riddell) 1230 ; disgorged by shark (ML) 40, 687
Armitage, A., Wolf, A., and Dannemann, F., History of Science, Technology, and Philosophy in the Sixteenth and Seventeenth Centuries (R) 195
Armstrong, A. R., on serum phosphatase (A) 953
Arsenical compounds, purpura hæmorrhagica [illegible] 74
Arterial— [illegible] H. C.
Romanis [illegible] rgery
of (G. V [illegible] Circu-
lation, Embolism, and Thrombosis
Arthritis, see Rheumatism
Artificial pneumothorax—for pleural pain (C. Shaw) 1280, (A) 1308, (C. A. Birch) (C) 1375, (F. H. Stevenson) 1463 ; in lobar pneumonia (W. E. Robertson) 1282, (A) 1308, (C. A. Birch) (C) 1375 ; see also Tuberculosis, pulmonary, surgery of
Artificial respiration—Holger Nielsen method (A) 437 ; new method of (Sir L. Hill) (C) 277 ; Schafer's or Sylvester's method of (C. J. Mijnlieff) 149, (C) 741, (LA) 139, (Y. Henderson) (C) 217, (F. L. Benham) (C) 801 ; see also Inhalation therapy
Artificial Sunlight (M. Luckiesh) (A) 1189
Ascaris infection, spread of (A) 313, (L. E. Napier) (C) 860
Aschheim-Zondek test, fœtal death and (P. M. F. Bishop) 364
Ascitic fluid—cancer cells in, 1297 ; melanin-bearing cells in (W. R. Snodgrass) 668
Ascorbic acid, see Vitamin C
Asherson, N., perforation of œsophagus (C) 691
Askins, R. A. (O) 1439
Asphyxi [illegible] Smellie)
1453 ; [illegible] appara-
tus f[illegible] J. B.
Blaikley [illegible]
Aspirin—poisoning (S. C. Dyke) 613, (LA) 619, (A. M. Wyllie) 768 ; use of (LA) 619
Assessors, see Evidence, medical
Association of Welsh Insurance Committees (LA) 835
Asthma—artificial fever in (A) 201 ; Asthma Research Council (A) 1191 ;
[illegible] L. Livingstone
(Lord Gorell)
[illegible] d (W. I. Card)
[illegible] L. Bansky) 79,
[illegible] bby) (C) 156 ;
Guy's Hospital clinic for (A) 317 ; sinusitis and (A) 1246 ; treatment of (LA) 379 ; vaccine therapy in (La vaccinothérapie dans l'asthme bronchique) (F. Nitti) (R) 720
Astreos, T. C., self-performed enterectomy, 191
Atebrin mussonate, see Malaria
Atelectasis, see Pneumonia and Respiratory
Atmospheric pollution—conference on, 1338 ; smoke and, 1099 ; smokeless fuel and (PI) 166
Atresia, congenital, of duodenum (T. G. D. Bonar) 822
Atropine poisoning (V. M. Métivier) 1232
Atslowe, Edward (R. R. James) 1445
Auricular fibrillation, emetine and (I. A. Sayid) 556

AUSTRALASIA, CORRESPONDENCE FROM.—British Medical Association meeting, 849—Cancer control, 637—Infantile paralysis, 638

Australia—aerial medical service in, 964 ; hospital contributory scheme in (LA) 671 ; medical education in (Lord Horder) 987 ; skin diseases in, 1073 ; Weil's disease in, 903
Australian and New Zealand Association of Radiology, 312
Authors, medical, in thirteenth century, 616
Autonomic nervous system, see Nervous system and Sympathectomy
Avertin—tetanus treated with (L. Cole) 246, (LA) 256, (P) 957 ; value of (Sir F. E. Shipway) (C) 343, (R. E. H. Simpson) (C) 404
Aykroyd, W. R., on nutrition, public health and, 341
Azotæmia—in acute Bright's disease (J. B. Rennie) 658 ; in rheumatism (A) 836

B

Bach, F., [illegible] 429
Bacillus [illegible] lcæmic
(W. M. [illegible] 718
Bacteriæmia, see Blood
[illegible] n to
ners)
250 ;
lents
. W.
of
General Bacteriology (E. O. Jordan) (R) 918 ; Twort d'Hérelle, phenomenon of (E. Wollman) 1312
Bailey, K. V., American maternity hospitals, 1213
Bailey, R. H., control of whooping-cough, 361, (LA) 377
Bain, W., [illegible]
Harrogate
Bainton, J. [illegible]
tive Electrocardiography (R) 196
Baird, D., forceps operation (C) 801
Baird, J. B., congenital abnormalities in genito-urinary tract, 1169
Baker, H. S., tissue extracts for cancer (C) 583
Baker, J. R., on spermicides (A) 779
Baker, R. St. B., on trees and national health, 1042
Baker, S. L., on bone absorption, 1257
Balanitis (A) 727
Bancroftian filariasis (A) 1471
Banister, J. B., on Cæsarean section, 788
Bankart, A. S. B., pain and euthanasia (C) 1432
Bankoff, G., disclaimer, 985
Bansky, L., gold salts in asthma, 79, (LA) 85
Banting, Sir F., on serum phosphatase (A) 953
B[illegible] in strepto-
(P) 35
B[illegible] bnormalities
[illegible] tract, 1169 ; dental
131
elocities of physio-
logical processes, 447 ; respiratory and vascular changes before and after birth, 647
Barling, Sir G., gold medal, 1309
Barling, S., on paralytic ileus, 1121 ; on surgical shock, 1412
Barlow, Sir T., birthday symposium (LA) 431 ; Royal Medical Benevolent Fund appeal (C) 859, (A) 836, (C) 1145
Barnard, W. G., on post-mortem technique (LA) 198
Barrett, Sir J., on economics of hospit provision (LA) 671 ; on racial pressu problems in Pacific, 901
Barrington-Ward, Sir L., on "acute abdomen" in childhood, 1370
's deformity, 428
A.B. vaccine for
) 1422
working capacity
10
ary gland
Basset, A., and Mialaret, J., L'épau (R) 26
Bather's itch, 451
Baths, see Health resorts and Physic treatment
Batteson, C. L., on representation members of Royal College of Surgeo 1258
Baumgartner, J. G., germicidal propert of mercury preparations (C) 1031
Baumgartner, L., and Fulton, J. F., Morbus Gallicus (R) 1126
Bayly, H. W., Triple Challenge (R) 558
B C G—in Algiers and Greece, 1369 ; in France, 337 ; value of, 37
Beaumont, G. E., erythrocyte sedimentation-rate, 19 ; protein shock in undula fever, 940

Beccle, H. C., on hæmatology of psychoses, 93
Becker, S. W., on neurodermatoses (LA) 1063
Beckman, H., proctalgia fugax (C) 634
Bed-clothes support and exerciser (A. T. Fripp) (NI) 194
Beddoes, T. L.—Thomas Lovell Beddoes, the Making of a Poet (H. W. Donner) (A) 1360
Bedford, D. E., on myocardial deficiency, 946
Bedson, S. P., psittacosis, 1277
Bed-wetting, *see* Enuresis
Beer, E., Tumours of the Urinary Bladder (R) 1415
Begg, A. C., on diabetic gangrene, 847
Begg, N. D., whooping-cough, 1113
Behaviour—Pacemakers in Relation to Aspects of Animal Behaviour (H. Hoagland) (R) 772
Behnke, Emil and Kate, biography of, 1273
Beit Memorial Trust, 153
Beith, J. Hay, the privileged profession, 799
Belfrage, S. H., unhappy colon (C) 159
Belisario, J. C., on mycological infections, 1074
Bellers, John (A. R. Fry) (R) 1183
Benham, F. L., artificial respiration (C) 801
Bennet, E. A., on nullity and impotence, 1233
Bennett, T. I., further steps towards slavery, 749; test for cancer (C) 1432
Benzol poisoning, 263, (A) 675
Berglund, H., and Medes, G., Kidney in Health and Disease (R) 23
Beri-beri, trematode infection and (A) 1015
Berkeley, Sir Comyns, on placenta prævia, 789
Bernhard Baron Trust, 1388
Bernou, A., and Fruchaud, H., Chirurgie de la *tuberculose pulmonaire* (R) 1007
Best, H., Blindness and the Blind in the United States (A) 1305
Bevan-Brown, C. M., on schools of psychology (A) 897
Bhat, S. R., curious epidemic of sore-throat (C) 1377
Bigger, J. W., Handbook of Bacteriology for Students and Practitioners of Medicine (R) 1416
Bilharzia, *see* Schistosomiasis
Biliary, *see* Gall-bladder and Gall-stone
Biochemical Society (A) 1189
Biochemistry—Annual Review of Biochemistry (J. M. Luck) (R) 617, 696; Biochemical Laboratory Methods (C. A. Morrow) (R) 430
Biology—Biology of the Individual (J. R. Hunt, T. K. Davis, and A. M. Frantz) (R) 1182, (A) 1189, 1300; epidemiology and, 1001; human trends and, 751; in schools, 925; School of Biology (C. Thesing) (A) 144
Birch, C. A., collapse therapy in pleuro-pneumonia (C) 1375
Birth, *see* Childbirth
Birth control, *see* Contraception
Birth-rate, *see* Vital statistics
Births, marriages, and deaths, weekly lists of, 58, 113, 171, 232, 284, 354, 407, 464, 538, 588, 640; 693, 748, 810, 867, 924, 979, 1042, 1100, 1149, 1212, 1271, 1334, 1390, 1444, 1493
Bishop, P. M. F., "pregnancy" test, death of ovum and, 364
Biskind, L. H., phenylmercuric salts, 1049, (A) 1070
Blacker, C. P., on birth control, 1181
Blacklock, D. B., and Southwell, T., Guide to Human Parasitology (R) 1416
Blacklock, J. W. S., on tuberculous meningitis (LA) 950
Blackwater fever in negro child (C. C. Chesterman) 554
Bladder—foreign body in (R. Farncombe) 825, (J. Cook) 1232; papilloma of, prognosis in (C. A. R. Nitch) (P) 781; Tumours of the Urinary Bladder (E. Beer) (R) 1415
Blaikley, J. B., endotracheal insufflation apparatus (NI) 138
Blind—Blindness and the Blind in the United States (H. Best) (A) 1305; white sticks for, 405
Blomfield, J., explosions in operating theatres (C) 1378
Blood—analysis of, anticoagulants and (A) 88; Clinical Atlas of Blood Diseases (A. Piney and S. Wyard) (R) 832; diseases of, sternal biopsy and (A) 1306; Disorders of the Blood (L. E. H. Whitby and C. J. C. Britton) (R) 669; fat content of, 1318; hæmoglobin estimation (E. R. Holiday, P. M. T. Kerridge, and F. C. Smith) 661, (A. K. Gordon) (C) 744, 964; morphology of (Entstehung und Funktion von Gefässsystem und Blut) (M. Hausmann) (R) 82; oral sepsis and (C. C. Okell and S. D. Elliott) 869; psychoses and, 93; punctate basophilia, chrysotherapy and (G. J. Griffiths and J. Race) 714; *see also* Agranulocytosis, Anæmia, Azotæmia, Leukæmia, and Plasma
Blood counts—in whooping-cough (N. D. Begg and M. F. Coveney) 1113
Blood pressure—variations in (LA) 1356
Blood pressure, high—headache and (Sir E. Spriggs) 1, 63; High Blood Pressure and its Common Sequelæ (H. O. Gunewardene) (R) 1299; obesity and, 847; prognosis in, 269, (L. N. Jackson) 350, (C) 582, (G. M. Wauchope) (C) 404; treatment of, 335, (J. L. Livingstone) 961
Blood sedimentation-rate—estimation of (G. E. Beaumont and J. W. Maycock) 19; in rheumatism (A) 836
Blood transfusion—donors, method of bleeding (H. L. Marriott and A. Kekwick) 78, (C) 218, (J. W. Shackle) (C) 158, 276, (P. H. O'Donovan) (C) 345; Henry and Jouvelet's pump (E. S. Lee and G. H. Macnab) 1242; improved technique for (J. E. McCartney) 1476; in aplastic anæmia (J. M. Holmes) 71
Blumer, G., Smith, D. P., and Sullivan, A. J., Practitioner's Library of Medicine and Surgery: Vol. VIII., Therapeutics (R) 771
Blyth, W., proctalgia fugax (C) 404
Board of Control, 685, (LA) 672
Board of Control for Scotland—appointment, 170; salaries of medical officers (PI) 227
Board of Education—chief medical officer's annual report, 1440
Bodansky, M., and Fay, M., Laboratory Manual of Physiological Chemistry (R) 618
Bodo caudatus, irradiation of (A) 675, 1192
Body—Body and its Health (W. Cullis and M. Bond) (R) 889; *see also* Physique
Bogert, L. J., Nutrition and Physical Fitness (R) 430
Bogus, *see* Imposters
Böhler, L., on fractures of femur (A) 315
Boils, origin of (L. P. Lockhart) (C) 861, (A. Whitfield) (C) 916
Bolliger, A., on determination of hæmoglobin, 964
Bonar, T. G. D., congenital atresia of duodenum, 822
Bond, C. J., on voluntary euthanasia, 1385
Bond, M., and Cullis, W., Body and its Health (R) 889
Bone—absorption of, 1257; calcification of, 843; decalcification, nervous factor in (A) 1421; dysostosis cleidocranialis (V. J. Kinsella) 303; infections of, 1119; Madelung's deformity (S. Barsoum) 428; pathology of, 844; pulmonary osteo-arthropathy (A) 895; tumours of, radiography of, 1199
Bone-marrow, *see* Anæmia
Bonney, V., on paralytic ileus, 1121; prognosis in fibroids (P) 626
Booysen, C., on quinine as contraceptive (A) 1133
Borneo, malaria in (A. J. Copeland) (C) 691
Borradaile, L. A., Elementary Zoology for Medical Students (R) 772
Botulism, 452, (LA) 559, 584, 639, (C. R. Lane and T. E. Jones-Davies) 717, (C. R. Lane) (C) 1377
Bougie, catheter and (M. Paul) (NI) 556
Boulton, B. J., agranulocytosis, 610
Bourne, A., on breech presentations, 942; prognosis of salpingitis (P) 331
Bovine pleuropneumonia (LA) 1064
Bovine tuberculosis—human, in Scotland (A. S. Griffith and J. Smith) 1339; Spahlinger vaccine (A) 780, (LA) 892, (PI) 1033, 1330; *see also* Milk
Bowdidge, E., Soya Bean, 1497
Bowel, *see* Intestine
Brachial, *see* Arm
Brackenbury, Sir H. B., on maternal mortality, 1256; Patient and Doctor (R) 722, (A) 729, (LA) 833
Bradshaw lecture, 1016
Braeuning, H., Lungentuberculose und Schwangerschaft (R) 24
Brailsford, J. F., on radiology, 195
Brain—abscess of, pancreatitis and (R. H. Dobbs) 989; Brain Preparations (J. W. Hultkrantz) (R) 1353; frontal lobes, functions of, 333; hypothalamic function, 333, 334, (A) 566, (Sir W. Langdon-Brown) 1155; hypothalamic tumour, pubertas præcox and (A) 32; tumours of (Tumeurs de l'encéphale) (D. Paulian) (R) 1183; ventriculography, 1368, by opaque injection (E. W. Twining and G. F. Rowbotham) 122; *see also* Head and Intracranial
Braithwaite, N. (O) 50
Brander, W., on chronic sick, 887, (A) 897
Brash, J. C., and Jamieson, E. B., Cunningham's Manual of Practical Anatomy (R) 832
Brazil, colonisation of, medicine during, 848
Breast—cancer of (A) 776, 1083, X rays in (G. E. Vilvandré) 1265; non-malignant diseases of, prognosis of (E. Pearce Gould) (P) 899
Breech presentations, 941
Brewer, D., on locust (A) 623
Brewster, G. B., My Channel Swimming Adventures, 1099
Bridge, J. C., herpes (C) 158
Bridges, M. A., Dietetics for the Clinician (R) 397
Briercliffe, R., on malaria in Ceylon, 1077
Bright's disease, *see* Nephritis
British Association—malaria, 631; personality and age (LA) 672; presidential address (LA) 620
British College of Obstetricians and Gynæcologists—dinner, 1210; diplomas, 864; elections, 169; fellows, 169, 1210; members, 169, 785, 1210
British Columbia—health insurance scheme for (PCP) 161
British Empire Cancer Campaign, 112, 410, (A) 1249
British Health Resorts Association—Margate conference, 791; meeting, 1148
British Institute of Philosophy, 866, 1095, (C) 1376, (A) 1358
British Institute of Radiology (A) 1192

BRITISH MEDICAL ASSOCIATION.—Alcohol and road accidents, 207, (A) 259—Animals, anaerobic toxæmias of, 963—Artificial pneumothorax, pleural effusion and, 1027—Australian aerial medical services, 964—Bone: calcification of, 843; pathology of, 844; tumours of, diagnosis of, 1199—British Medical Bureau, 207—Cæsarean section, 788—Carcinoma of colon, 904—Consultants, whole time, 212—Contract practice, extension of, 208, (LA) 255—Diabetic gangrene, 847—Ethics, medical, 209—Fractures, 207—Glaucoma, 1139—Hæmoglobin, [illegible] of, 964 —Hæmolytic [illegible] 264—Hydatid [illegible] drugs, 1074 [illegible] Health, 211, [illegible] ception, 119[illegible] 844—Llanel[illegible] 34—Lung [illegible] 1198—Measles prophylaxis, 210—Medical benevolence, 265—Medical curriculum, 266, (LA) 511—Melbourne meeting, 785, 843, 849, 900, 963, 1025, 1137, 1196—Mental hygiene, social aims of, 965—Midwifery in general practice, 210—Miners' nystag[illegible] infections, 1074 [illegible] Service, 1374, [illegible] Committee, 207, (A) 562—Obesity, 604, 846—Opticians, 209—Otitis media, 1025—Pancreas, surgery of, 845—Pink disease, 1196—Placenta prævia, 789—Poison gas precautions, war mentality and, 265—Post-mortem provisions (LA) 198—Pregnancy, toxæmias of, 1137—Presidential address (LA) 671—Prostatectomy, 903—Psycho-analysis, 1215—Psychoses of adolescence, 905—Puerperal sepsis, 1138—Racial pressure problems in Pacific, 900—Representative body, 206, 264—Scotland: health services in, 266; nurses' training in, 266—Sea-bathing, 1026—Secret remedies, 207—Services, the, 264—Skin: diseases of, in Australia, 1073; staphylococcal infections of, 1073—Sphenoidal sinusitis and pituitary gland, 1026—Teratomata, 844—Thyrotoxicosis, 786—Tropical medicine, 901—Tuberculous empyema, 1028—Ultra-violet light therapy in laryngeal tuberculosis, 1026—Urinary antiseptics, 1076—Vasoconstrictor principle in skin of frog, 1076—Virus infections, inapparent, 963—

Weil's disease, 903. *See also* Osteopathy

207
Conference (LA)

British Postgraduate Medical School—866; lecture-demonstrations, 747; refresher courses, 55, 112, 1016
British Red Cross Society—air raid casualties, lectures on, 692, 1389; ambulance service for Abyssinia (A) 956, 1037, 1153, 1483; national oxygen tent service, 694, (A) 1358
British Scientists of the Nineteenth Century (J. G. Crowther) (R) 196
British Social Hygiene Council—congress, 58, 134; dinner, 170; work of, 353
Britton, C. J. C., and Whitby, L. E. H., Disorders of the Blood (R) 669
f, 1448
usell) 408
(A) 1131
Bronchi—foreign bodies in (V. E. Negus) (P) 730; inspection of (N. Patterson) 1019
Bronchiectasis, *see* Lung
Brookfield, R. W., on enuresis, 1119
Brown, D., pyosalpinx due to *S. newport*, 1173
Brown, G. L., on ergometrine, 1259
Brown, L. G., on otitis media, 1025
Brown, W., on psycho-analysis, 1215
Brown, W. M., septicæmia due to *B. fæcalis alkaligenes*, 718
Browne, D., undescended testicle (C) 1484
Browne, F. J., placenta prævia, 959
Browne, F. W. S., Ludovici, A. M., and Roberts, H., Abortion, 1446
Bruce, J., and Walmsley, R., Beesley and Johnston's Manual of Surgical Anatomy (R) 25
Bryan, C. W. G., prognosis in acute empyema (P) 91
Bryce, G. (O) 859
Bubis, J. L., Puerperal Gynæcology (R) 1465

BUCHAREST, CORRESPONDENCE FROM.—Academy of medical sciences, 338—Antisemitism among students, 338, 736—Chemists, manufacturing, regulation of, 1491—Compulsory medical work in cou
qualified maste
immunisation,
—Health insu
Prof., retirement of, 338—Medical officers of health, examination for, 736—Rabies: institute, 736; journal, 1492—Salt, medicinal, sale of, 736

Buckley, C. W., Reports on Chronic Rheumatic Diseases (A) 30

BUDAPEST, CORRESPONDENCE FROM.—Budapest University, tercentenary of, 1319—Caustic potash, poison label for, 578—Childless, taxation of, 579—Dermatology, congress of, 1078—Duel between doctors, 578—Medical profession, plight of, 450—Professors: honoured, 450; retirement of, 451—Students' olympiad, 578—Wine, consumption of, 578

Bühler, C., From Birth to Maturity, 695
Bulloch, W., on medical periodical literature (A) 955
Bureau of Hygiene and Tropical Diseases, 922
Burn, G. W. (O) 1209
Burnet, E., on nutrition, public health and, 341
Burnet, F. M., on inapparent virus infections, 963
Burns—cod-liver oil for (J. P. Steel) 290, (E. Stevenson) (C) 1376; corrosive (A) 1419; Modern Treatment of Burns and Scalds (P. H. Mitchiner) (R) 1354; streptococcal infection and (LA) 834; *toxæmia of (F. Marsh) (C)* 1088
Burns, J. W., on breech presentations, 941
Burrell, L. S. T., on tuberculosis in children, 39; radiography upside down (C) 48
Burstein, J., and Bainton, J. H., Illustrative Electrocardiography (R) 196
Burt, C., Subnormal Mind (R) 617
Buschke, F., and Schinz, H. R., Krebs und Vererbung (R) 136
Butenandt, A., corpus luteum hormone (C) 454, (A) 438
Butterfield, F., death of, 1423

C

Cade, S., combined distance radiation of hypopharyngeal cancer, 652, (A) 675
Cæsarean section—788; prognosis of (E. Holland) (P) 1135
Caiger, H., on miners' nystagmus, 265
Cairns, H., on hydrocephalus, 332; prognosis of pituitary tumours (P) 1310, 1363
Calcaneus, fractures of (W. E. Tucker) (C) 46
Calciferol in tetany (R. S. Stacey) 656
Calcium metabolism, *see* Bone
Calcutt, J. E., and Hinton, J. P., Sterilisation: A Christian Approach, 751
Calcutta School of Tropical Medicine (A) 564
Callow, R. K., derivatives of androsterone, 77; on new source of hormones (A) 1189
Cambridge electrode jelly (H. B. Russell) 1172
Cameron, H. C., on after-effects of accidents, 1117
Campbell, H. J. (O) 107
Campbell, Dame J., independent midwife (C) 1145; on maternal mortality, 1254
Camphor, action of, 1122
Canadian Medical Association (LA) 1417
Cancer—carcinogenesis (A) 1249, by cracked mineral oils (C. C. Twort and J. M. Twort) 1226; carcinoma telangiectaticum *(A) 1013; cells in pleural* and peritoneal effusions, 668, 1297; cells in sputum (A) 1247; control of, in Australia, 637; familial incidence of (A) 437; heredity and (Krebs und Vererbung) (H. R. Schinz and F. Buschke) (R) 136; Imperial Cancer Research Fund, 1315; in general practice (Die Krebsbehandlung in der *Täglichen Praxis) (A. Neumann) (R)* 196; in Kenya natives (F. W. Vint) 628; intracranial (Tumeurs de l'encéphale) (D. Paulian) (R) 1183; lateral aberrant thyroids and (A. L. d'Abreu) 1406; melanotic sarcoma (E. S. Horgan) (C) 156, free melanin-bearing cells and (W. R. Snodgrass) 668; Mucous and Salivary Gland Tumours (H. E. Ahlbom) (R) 1415; œstrin and (Sir W. Langdon-Brown) 1155; proteolytic enzymes in (A) 898, (W. E. Gye) (C) 915; research on, 410, (A) 1249; test for (C) 1377, (T. I. Bennett) (C) 1432; tissue extracts for (H. S. Baker) (C) 583; Tumours of the Urinary Bladder (E. Beer) (R) 1415; X-rays in (G. E. Vilvandré) 1265; *see also* British Empire *Cancer Campaign, Radium*, and—
Cancer of—bone, radiography of, 1199; breast (A) 776, 1083, 1265; cervix, corporeal recurrence after, 1464; colon, 904; gall-bladder (A) 261; hypopharynx, combined distance radiation of (S. Cade and F. M. Allchin) 652, (A) 675; larynx (LA) 1186, (A) 1247; *liver (J. A. Martinez) 1293*; lung, increase of (LA) 620; lung, osteo-arthropathy and (A) 895; lung, sputum from (A) 1247; œsophagus (R. Mailer) 1052; ovary, 1463; pylorus, achlorhydria in (J. A. Ryle) (C) 46; salivary glands (D. C. L. Fitzwilliams) 769; sigmoid and sigmoid rectum, resection for (D. P. *MacGuire)* 1114, (J. P. Lockhart-Mummery) (C) 1207; skin, surgery of (H. T. Simmons) 938; stomach, gastroscopy in (H. C. Edwards) 1161, (LA) 1244; stomach, radiography of, 1368; suprarenal, basophilism and (D. C. Hare, J. M. Ross, and A. C. Crooke) 118; testis, prognosis in (K. M. Walker) (P) 1424; uterus, 1058, 1083
Cannon, D. J., on fibroids, 1059
Cannon, W. B., on chemistry of nervous system, 447
Cantin, Y., torsion of spleen, 1175
Capel, E. H., eunuchoidism, 886
Carbolic acid poisoning, *olive oil in* (A) 623
Carbon disulphide, dangers of (A) 1469
Card, W. I., asthma sensitivity to chromates, 1348
Cardiac, *see* Heart
Carlill, H., proctalgia fugax (C) 742
Carling, E. R., plan for hospital, 1314
Carrel, A., on survival by perfusion (A) 34
Carter, G. B., service of midwives, 277
Carter, H. S., erythromelalgia and proctalgia fugax, 372
Castle, W. B., on sprue (LA) 1127; reticulocyte reactions, 319, (LA) 312
Cataract, dinitrophenol and (A) 261
Catechism Series, 1447
Cathcart, E. P., on physique in industry (LA) 199
Catheter—adapter for (O. Walker) 926; bougie and (M. Paul) (NI) 556
Cawston, F. G., non-toxic antimony administration (C) 47
Census, the (A) 954
Central Association for Mental Welfare (LA) 672
Central Council for Care of Cripples, 1117, 1473
Century of Municipal Progress (R) 1006

and pathology of, 332
Cervix, *see* Uterus
Ceylon—malaria in, 631, (A. J. Copeland) (C) 691, 1077, 1176; maternal mortality in (PI) 110
Chadwick lectures, 865, 1042, 1099
Chaikin, G., on plantar warts (A) 435
Chalmers, C. H., Bacteria in Relation to the Milk Supply (R) 831
Chalmers, J. G., on physique in industry (LA) 199
Chamberlain, E. N., on coronary thrombosis, 1004
Chambers, H. (O) 228
Chandler, F. G., internal pneumolysis, 879, (LA) 891
Channel swimmers—first (A) 438; My Channel Swimming Adventures (G. B. Brewster) 1099
Charaka Club (A) 383
Charcot's bath, 114
Charing Cross Hospital medical school, 908, 1188
Charlatanism, *see* Unregistered practitioners
Chartered Society of Massage and Medical Gymnastics (A) 260, 588
Chaudhuri, R. N., on epidemic dropsy (A) 1360
Cheatle, Sir L., medical assessors (C) 860
Chemistry—forensic medicine and (A) 1013; Laboratory Manual of Physiological Chemistry (M. Bodansky and *M. Fay) (R) 618; Physical Chemistry* (D. I. Hitchcock) (R) 137
Chemotherapy, *see* Drugs
Chesley, V. E., and Hertzler, A. E., Diseases of the Thyroid Gland (R) 772
Chesney, G., on diphtheria immunisation (A) 380
Chesterman, C. C., blackwater fever in negro child, 554
Chicken-pox, alastrim and, 1236, (A) 1305
Childbirth—maternity hospitals in America (K. V. Bailey) 1213; national maternity service, British Medical Association on, 1374, (PI) 1489; painless, 1391, (PI) 1442; *see also* Fœtal, Maternal mortality, Midwifery, Obstetrics, and Puerperal
Child guidance—in Australia, 965; in *Sheffield, 641*
Children—accidents to, after-effects of, 1117; "acute abdomen" in, 1370;
cong T. G. D.
Bon of (A)
1068 1215,
(R. oma in
Chil ases of

Gage) 115; employment of, in agriculture (PI) 54; From Birth to Maturity (C. Bühler) 695; in factories, health of (PI) 1384, 1388, (A) 1362; Invalid Children's Aid Association, 1117; kwashiorkor in (C. D. Williams) 1151, (H. S. Stannus) (C) 1207; Modern Methods of Feeding in Infancy and Childhood (D. Paterson and J. F. Smith) resis in
(A) 14 (R. H.
Dobbs) *disease,*
1196; Lowen-
feld) (intra-
cranial thrombosis in (P. R. Evans) 12; pre-school, 39, 152; Psychological Aspects of Child Development (S. Isaacs) 695; pyuria in (A) 777; Recent Advances in Diseases of Children (W. J. Pearson and W. G. Wyllie) (R)

Dawson, W. S., on psychoses of adolescence, 905
Day, J. M. (O) 49
Deafness—care of deaf (PI) 51; hearing aids (A) 728, 1391; measurement of (Sir J. Dundas-Grant) 996
Deanesly, R., derivatives of androsterone, 77
Death—Care of the Aged, the Dying, and the Dead (A. Worcester) (R) 430; certificate, error in (ML) 446; certification, definition in, 395, problem of (D. Leys) (C) 581; *see also* Euthanasia and Vital statistics
Decalcification, *see* Bone
De Konrád, E., treatment of eclampsia (C) 635
Dementia præcox, pyrotherapy in (D. Menzies) 994
De Navasquez, S., on renal cortical necrosis in pregnancy (A) 1306
Dental, *see* Teeth and—
Dental Board—duties of, 466; penal cases, 1323
Dental Register—foreign dentists, 1325
Dentistry—dentist's mind and fingers (Sir F. Dyke Acland) 856; *see also* Teeth
De Rivas, D., and de Rivas, C. T., Clinical Parasitology and Tropical Medicine (R) 1466
Dermatology, *see* Skin
Devenish, E. A., Colles's fracture, 821
Deville, P. M., gold treatment of rheumatoid arthritis (C) 157
Devine, G., Psychology of Everyman (R) 1416
Devine, H. B., on carcinoma of colon, 904
Dew, H. R., on hydatid disease, 844
Diabetes—Diabetes Mellitus and Obesity (G. G. Duncan) (R) 306; duodenal extract in (A) 30, (H. Cohen) (C) 106; gangrene and, 847; in children, diet and (A) 1068; life assurance and, 270; unqualified practitioner and (ML) 630; *see also* Insulin
[illegible] (W. P. [illegible] 196 [illegible] (F. G. Nicholas and A. M. Nussbrocher) 611; Hedblom's syndrome, 286
Dible, J. H., on coronary thrombosis, 1004
Dickson, E., on legal aspect of drunkenness (A) 31
[illegible] 933 [illegible] ction- [illegible] C. L. Miller) (R) 670
Diesel fuel oils, carcinogenesis by (C. C. Twort and J. M. Twort) 1226
Diet—civilisation and (T. I. Bennett) 749; Diet and Physical Efficiency (H. W. [illegible] (A) 729 [illegible] Lewis [illegible] 1100; [illegible] P. C. Es[illegible] i [illegible] (J. B. Hunter) (C) 1431; ketogenic, 127, (LA) 140; leprosy and (A) 203; maize, kwashiorkor and (C. D. Williams) 1151, (H. S. Stannus) (C) 1207; Modern Methods of Feeding in Infancy and Childhood (D. Paterson and J. F. Smith) (R) 832; obesity and (J. H. Anderson) 604, 846; of diabetic children (A) 1068; of farmers, 341; of infants (A) 258; potato, value of (A) 837; rice, epidemic dropsy and (A) 1360; Soya Bean (E. Bowdidge) 1497; sprue and (LA) 1127; *see also* Food and Nutrition
Digestion, food allergy and (A) 90
Diggle, F. H., on acute frontal sinusitis, 1349
Digitalis therapy (A. Fraenkel) 1101
Dinitrophenol—agranulocytosis and (A) 894; cataract and (A) 261; *see also* Obesity

DINNERS.—British College of Obstetricians and Gynæcologists, 1210—British Social Hygiene Council, 170—Buckston Browne dinner, 1204—Certifying Factory Surgeons, 1388—Charing Cross Hospital, 865—Chelsea Clinical Society, 922—King's College Hospital, 865—London Hospital, 980—Medico-Legal Society, 1442—Middlesex Hospital, 807—Royal Free Hospital, 1329—Royal [illegible] sociation, 95—[illegible] spital, 1065—[illegible] —St. Thomas's [illegible] of Medical [illegible] of Health, 1269—Surgical Instrument Manufacturers' Association, 1095—West London Medico-Chirurgical Society, 112—Westminster Hospital, 807

Diphtheria—antitoxin for tonsillitis (S. R. Bhat) (C) 1377; bacteriological diagnosis of, 250; carrier of, sore-throat epidemic and, 740, (J. O. Hollick) (C) 860; immunisation against, 250, (A) 380, 736, (A. T. Powell) (C) 1145, (PCP) 1373; Moloney test, formol toxoid and (R. Swyer) 22; paralysis in, 80; type incidence of *C. diphtheriæ* in Manchester (D. T. Robinson and F. N. Marshall) 441
Diploma in Child Health (LA) 773
Diploma of Public Health, 587
Disability, *see* Injuries
Disclaimer, 985
Disease, *see* Medicine
Disinfection, *see* Skin
Disseminated sclerosis, pathogenesis of, 334
Dixon, A. F., resignation of, 1261
Dobbie-Bateman, M. L., on health of shop assistants (LA) 378
Dobbs, R. H., acute pancreatitis in childhood, 989, (LA) 1063
Dobson, M., Amblyopia Reader (LA) 378
Doctors, *see* Practitioners, medical
Dodds, E. C., drugs with a camphor- and coramine-like action, 1122
Dogliotti, A. M., Trattato di Anestesia (R) 1062
Donations and bequests, 16, 170, 271, 641, 692, 747, 835, 952, 1473
Doors of Hope (M. Hankin) 591
Dorland's Medical Dictionary (W. A. N. Dorland and E. C. L. Miller) (R) 670
Dorsey, J. M., Foundations of Human Nature (R) 1300
Dougal, D., on maternal mortality, 1255
Douglas, C. A., on maternal mortality and morbidity, 159
Douglas, M., agranulocytic anæmia, 1461
Douthwaite, A. H., and Hale-White, Sir W., Materia Medica, Pharmacy, Pharmacology, and Therapeutics (R) 890
Drain introducer (T. J. D. Lane) (NI) 254
Dream analysis, 829, (A) 837
Drennan, A. M., on pathology of osseous tissue, 844
Drewitt, F. D., Bombay in the Days of George IV., 1099
Drinker, C. K., on elephantiasis (A) 1471
[illegible] 1360 [illegible] ML) 446; *see also* [illegible]
Drugs—Craig's "Posological Tables," 751; Ethical Pharmaceuticals Association, 463; hypnotic, 1074, (LA) 1187; in streptococcal infections (A) 840; Morton's "Principal Drugs and Their Uses," 751; prescriber's list, 1448; secret remedies, 97, (LA) 83, 207; [illegible] and Prescribing
Drummond, J. C., William Stark, 459, (LA) 431
Drunkenness, *see* Motorists and Road accidents
Dudgeon, L. S., on malignant cells in sputum (A) 1247
Dudley, H. W., death of (A) 839
Dudley, S. F., on biological approach to epidemiology, 1001
Dufferin Fund (A) 142
Duguid, J. B., cardiac hypertrophy in experimental nephritis, 421
Duke, H. L., old "laboratory" strains of polymorphic trypanosomes, 665
Duncan, G., intussusception due to Meckel's diverticulum, 1174
Duncan, G. G., Diabetes Mellitus and Obesity (R) 306
Duncan, W. (O) 746
Dundas-Grant, Sir J., measurement of loss of hearing, 996
Dunhill, Sir T., on thyrotoxicosis, 786
Dunkerley, A. H., subarachnoid hæmorrhage, 1461
Dunlop, H. A., pain as neurological symptom, 909
Duodenal extract in diabetes (A) 30, (H. Cohen) (C) 106
[illegible] D. [illegible] (J. [illegible] 764, [illegible] iller and H. C. Gage) 115; *see also* Peptic ulcer
Dutton, T. (O) 1147
Dwyer, Sir F. C. (O) 919
Dye dermatitis (J. T. Ingram) 239
Dyke, S. C., acetylsalicylic acid poisoning, 613, (LA) 619; future of pharmacy (C) 103
Dysentery, amœbic, water-borne, 451
Dysostosis cleidocranialis (V. J. Kinsella) 303

E

Eadie, C., on sphenoidal sinusitis and pituitary gland, 1026
Eager, R., treatment of scabies (C) 917
Ear—clinics, American (M. Ellis) 643; Recent Advances in Laryngology and Otology (R. S. Stevenson) (R) 1298; Siegel's speculum, modified (A. Miller) (NI) 81; *see also* Mastoiditis and Otitis
Eardley-Wilmot, R. (O) 1381
Earle, H. G., on Lester Institute of Medical Research, Shanghai (A) 316
East, T., prognosis in heart-block (P) 205
Eclampsia—Cæsarean section and (E. Holland) 1135; endocrine disorder and (A) 564; treatment of (E. de Konrád) (C) 635
Ectopic pregnancy, 1296
Eczema, *see* Skin
Eden, T. W., independent midwife (C) 1088
Edgecombe, W., fracture of ribs in whooping-cough, 374
Education, medical—(Lord Horder) 987; Catechism Series [illegible] Child Health (LA [illegible] and (A) 142; in [illegible] in medical psych[illegible] (R. A. Noble) (C [illegible] 1328; medical [illegible] (LA) 511, 987, 1029, 1425, in Austria, 396; Story of Middlesex Hospital Medical School (H. C. Thomson) (R) 251; students' guide, 465; *see also* Examinations and Universities
Edwards, H. C., gastroscopy, 1161, (LA) 1244
Edwards, J. G., on radiography of lung diseases, 1198
Edwards, J. T., on hedgehogs and the common cold (A) 1307
Edwards, P. W., on pulmonary tuberculosis, 1179
Edwards, Tudor, surgery of pulmonary tuberculosis, 853, (LA) 891
Eggs, raw, for insomnia and neurasthenia (I. Singh) (C) 636
Ehrlich, P., life and work of, 449
Eidinow, A., on sensitisation to light (A) 315
Elam, J., gas-and-air apparatus for midwives, 1253; laryngoscope, detachable (NI) 616; salaried service of midwives (C) 344
Electric shock—domestic electrical appliances and (PI) 55; fatal case of (A. H. D. Richmond) 16; injuries from, 1002, (LA) 1010; in operating theatres (Sir J. E. Potavel) (C) 1327, (J. Blomfield) (C) 1378; subjective sensation and (C. W. Hume) 1021, (LA) 1010, (PI) 1490; treatment of (LA) 139 [illegible] ous fumes [illegible] ambridge elec- [illegible] Russell) 1172; [illegible] (C. C. Maher) [illegible] (R) 196; U wave [illegible] (E. Hinden) 1228
Electrokinetic Phenomena (H. A. Abramson) (R) 25
Electrotherapy 1910–35, 1001
Elephantiasis in Bancroftian filariasis (A) 1471
[illegible] rsin (R) 26 [illegible] (O) 746 [illegible] usception, 922, [illegible]
Elliott, S. D., bacteriæmia and oral sepsis, 869
Ellis, A. W. M., pyelitis, 127, (LA) 140
Ellis, M., oto-rhino-laryngological clinics, American, 643
Ellis, R., gold treatment of rheumatoid arthritis (C) 276
Elmer, W. P., and Rose, W. D., Physical Diagnosis (R) 196
Elmslie, R. C., prognosis in internal derangement of knee-joint (P) 1251
Elwell, H. W., aluminium kettle (C) 1484
[illegible] me) 1231, [illegible] (C) 1431; [illegible] and (LA)

1417 ; embolectomy for (V. Riddell) 1230 ; pulmonary (A. G. Cross) 1409 ; *see also* Arterial
[illegible] Animals Develop [illegible] 1241 ; Intro- [illegible] Embryology (W. Shumway) (R) 1241
Emerson, C. P., Nervous Patient (R) 831
Emetine, auricular fibrillation following (I. A. Sayid) 556
Empyema—acute, prognosis in (C. W. G. Bryan) (P) 91 ; osteo-arthropathy and (A) 895 ; treatment of (A) 674 ; tuberculous, 1028
Encephalitis—epidemic, prognosis in (Sir A. J. Hall) (P) 147 ; neurotropic viruses of (E. W. Hurst) 697, 758 ; post-vaccinal (PI) 1442
Encephalomyelitis, acute, 335
Encyclopedias—Encyclopedia of Veterinary Medicine, Surgery and Obstetrics (G. H. Wooldridge) (R) 376
Endocarditis, *see* Heart disease
[illegible] amidopyrin sensitivity [illegible] ; [illegible] of the Endocrine [illegible] (H. Z[illegible]) (R) 135 ; integration of (Sir W. Langdon-Brown) 1155 ; mental disorder and, 93 ; Year Book of Neurology, Psychiatry, and Endocrinology (H. H. Reese, H. A. Paskind, and E. L. Sevringhaus) (R) 1241 ; *see also* Obesity and Sex hormones
Endoscopy, *see* Tuberculosis, pulmonary, surgery of
Endotracheal insufflation of the new-born (G. F. Gibberd and J. B. Blaikley) (NI) 138
Engelkes, H., hæmorrhagic disorders treated with vitamin C, 1285
Ensol, *see* Enzymes
Enterectomy, self-performed (T. C. Astreos) 191
Enteric fever—in France, 1369 ; paratyphoid outbreaks, 50, (PI) 347, 805 ; shell-fish and, 336 ; typhoid fever in Belfast, 588 ; typhoid fever in Scotland, Lourdes pilgrimage and, 406, 452
Enuresis (A) 143, ephedrine in, 1119
Enzymes, proteolytic, in cancer (A) 898, (W. E. Gye) (C) 915
Epicondylar fractures, 1257
Epidemiology, *see* Infectious diseases and Puerperal infection
Epidural hæmorrhage due to hæmophilia (W. M. Priest) 1289, (W. J. Rutherfurd) (C) 1378
Epigastric hernia (H. F. W. Warden) (C) 637
Epilepsy—causes and treatment of, 268, 334 ; crime and (ML) 267 ; cysticercosis and (W. P. MacArthur) (C) 1430 ; International League against Epilepsy (A) 1422 ; traumatic (C. P. Symonds) 1217
Epithelioma, *see* Cancer
Epsom College, 283, 1444, 1473
Erdmann, R., death of (A) 625
Ergometrine and ergotocin, 1259
Erikson, D., on pathogenic actinomycetes (A) 1014
Erysipelas, prognosis in (H. W. Barber) (P) 35
Erythema nodosum, tuberculosis and (A) 1421
Erythromelalgia, proctalgia fugax and (H. S. Carter) 372
Eschweiler, P. C., and Anderson, G. E., Diet Control (R) 252
Ethical Pharmaceuticals Association, 463
Ethiopia, *see* Abyssinia
Eugenics—future of, 751 ; *see also* Sterilisation, eugenic
Eunuchoidism (E. H. Capel) 886
Euthanasia—Voluntary Euthanasia (Easy Death) Legalisation Society (A) 1012, 1329, 1385, (A. S. B. Bankart) (C) 1432, (A. Piney) (C) 1432, (L. Rogers) (C) 1485
Evans, F., on cyclopropane anæsthesia (A) 1362
Evans, Geoffrey, dosage of alkali (C) 582
Evans, Griffith, death of, 1381, hundredth birthday, 405
Evans, P. R., post-operative intracranial thrombosis in childhood, 12
Everest, Mount, attempt on, 1438
Everyman in Health and in Sickness (H. Roberts) (LA) 833
Evidence, medical—in criminal cases (ML) 1481 ; in High Court cases (LA) 774, (Sir L. Cheatle) (C) 860 ; judge's question and (ML) 267
Evipan sodium anæsthesia, premedication and (R. W. Nichol) (C) 861
Evolution—Head, Heart, and Hands in Human Evolution (R. R. Marett) (R) 720 ; Heredity and Evolution (A. E. Watkins) (R) 1354 ; of ciliary action (A) 1066
Examinations — examination papers, 1042 ; International Institute Examinations Enquiry (Sir P. Hartog and E. C. Rhodes) (LA) 1303 ; M.B., B.S. Finals (F. M. Heggs) 926
Exophthalmos (Sir T. Oliver) 1116
Explosions, *see* Anæsthesia
Explosives, risks of (ML) 41
Ex-Services Welfare Society, 297, (LA) 311
Eyes—cataract, dinitrophenol and (A) 261 ; exophthalmos (Sir T. Oliver) 1116 ; glare shield, 114 ; glaucoma (A) 201, 1139 ; optic atrophy, hereditary (A) 1249 ; plastic surgery of eyelids, 100 ; quinine amblyopia (S. Tibbles) (C) 1089 ; trachoma (LA) 434 ; *see also* Miners, Ophthalmology, Squint, and Vision

F

Faber, K., Gastritis and its Consequences (R) 306
Face, *see* Plastic surgery
Factories, *see* Industrial medicine
Fæcal incontinence (J. Hartsilver) 427
Fairbairn, J. S., on toxæmias of pregnancy, 1137
Faith-healing, medicine and (C. L. Leipoldt) 1494
Fallopian tubes, *see* Ectopic pregnancy and Salpingitis
Falls, free, in space (A) 1013
Falta, W., Festschrift, 286
Fantus, B., Year Book of General Therapeutics (R) 1241
Farncombe, R., foreign body in bladder, 825
Fat content of blood, 1318
Fat metabolism, liver function and (H. Selye, J. B. Collip, and D. L. Thomson) 297
Fat necrosis, perforated duodenal ulcer and (M. J. Smyth) 15
Fawcitt, R., on fungoid infections of lungs, 1368
Fay, M., and Bodansky, M., Laboratory Manual of Physiological Chemistry (R) 618
Fear and pain (Sir W. Langdon-Brown) 911
Fellowship of Medicine, *see* Post-graduate courses
Femur—fractures of, ambulatory treatment of (A) 315 ; fractures of neck of, insertion of Smith-Petersen nail in (E. I. Lloyd) 129, (R. Watson Jones) (C) 217
Fenton, J., on Housing Act, 862
Fernando, Sir H. M. (O) 1487
Fernando, P. B., death after injection of atebrin mussonate, 1056
Fever, *see* Infectious diseases, Pyrotherapy, and Temperature
Fibroids—large, removal of, 1059 ; prognosis in (V. Bonney) (P) 626
Films, *see* Cinematograph films
Fingerprints, taking of (ML) 576
Fire-walk demonstration, 750
Fish, furunculosis in (A) 1066
Fishman, J. F., Sex in Prison (R) 1300
Fistula—duodenocolic (J. Mindline and M. L. Rosenheim) 764, (A. H. Saleh) 1117 ; gastrocolic (R. P. P. Davies) 678, (A. F. Hurst) (C) 1145, (T. Warwick) (C) 1432 ; urinary, following appendicectomy (V. Riddell) (C) 971
Fitzwilliams, D. C. L., salivary gland tumour, 769
Foerster, O., Hughlings Jackson lecture, 335
Fœtal—death, causes of (J. M. Smellie) 1453 ; death, tests for (P. M. F. Bishop) 364 ; respiratory and vascular changes (Sir J. Barcroft) 647
Folk-lore, *see* Mythology
Food—allergy (A) 90 ; aluminium in (A) 954, (H. W. Ellwell) (C) 1484 ; storage of (A) 566 ; *see also* Diet and Nutrition
Food passages, upper, *see* Œsophagus and Throat
Food poisoning—alleged (ML) 267 ; at Nelson, 160, 584 ; at Swansea, 693, 747 ; Ministry of Health memorandum (A) 89 ; *see also* Botulism
Foot—hallux valgus and hallux rigidus, prognosis of (E. I. Lloyd) (P) 263 ; plantar warts (A) 435
Forceps—for abdominal drainage (A. K. Henry) (NI) 1414 ; obstetric (A. J. Wrigley) 702, (LA) 725, (D. Baird) (C) 801, (J. L. Morton) (C) 801 ; stomach-holding (T. J. D. Lane) (NI) 253
Foreign bodies—in air and upper food passages (V. E. Negus) (P) 730, 1019 ; in bladder (R. Farncombe) 825, (J. Cook) 1232 ; in tonsil (W. J. Susman) (C) 584 ; shrapnel in chest, pension and (PI) 227 ; swallowed, œsophagus perforated by (J. E. G. McGibbon and J. H. Mather) 593, (N. Asherson) (C) 691
Forensic—chemist (A) 1013 ; Forensic Chemistry and Scientific Criminal Investigation (A. Lucas) (R) 1007 ; Forensic Medicine (D. Kerr) (R) 24 ; *see also* Medicine and the Law
Forrester-Brown, M., plaster technique (C) 915
Forty, F., dislocation of patella, 1046
Foster, H. M. G., agranulocytic anæmia, 1461
Foundations of Human Nature (J. M. Dorsey) (R) 1300
Fox, F. W., on vitamin-C content of foodstuffs (A) 1470
Fox, J. J., appointment, 1473
Fracastor: Syphilis or the French Disease (H. Wynne-Finch and J. J. Abraham) (A) 89
Fractures—Colles's fracture (E. A. Devenish) 821 ; dislocations and, treatment of (Traitement des fractures et luxations des membres) (J. Leveuf, C. Girode, and R.-C. Monod) (R) 1060 ; Guy's Hospital clinic (A) 318 ; Modern Treatment of Fractures (H. W. Spiers) (R) 82 ; plaster technique (K. H. Pridie) 680, 732, (LA) 723, (H. O. Clarke) (C) 802, (M. Forrester-Brown) (C) 915 ; *see also*—
Fractures of—calcaneus (W. E. Tucker) (C) 46 ; femoral neck, insertion of Smith-Petersen nail in (E. I. Lloyd) 129, (R. Watson Jones) (C) 217 ; femur, ambulatory treatment of (A) 315 ; internal epicondyle of humerus, 1257 ; os calcis, 1256 ; ribs in whooping-cough (W. Edgecombe) 374 ; vertebral bodies, prognosis in (H. E. Griffiths) (P) 439
Fraenkel, A., digitalis therapy, 1101
France—sanatorium village (A) 676
Franklyn, C. A. H., medical degrees of continental universities (C) 1484
Frantz, A. M., Hunt, J. R., and Davis, T. K., Biology of the Individual (R) 1182, (A) 1189, 1300
Franzen, R., on assessment of nutrition (LA) 951
Frazer, E. M. R., fatal menstruation, 1058
Freeman, E. T., on pellagra, 1239
Friedman test, fœtal death and (P. M. F. Bishop) 364
Friel, A. R., evolution of medical policy and practice (C) 345
Fripp, A. T., bed-clothes support and exerciser (NI) 194
Frog, skin of, vasoconstrictor principle in, 1076
Frossard, P. E. F., orchidectomy on the high seas, 1409
Frost, W. A., death of, 1016, (O) 1096
Fruchaud, H., and Bernou, A., Chirurgie de la tuberculose pulmonaire (R) 1007
Fry, A. R., John Bellers (R) 1183
Fry, H. K., Introduction to General Therapeutics (R) 1182
Fuller, A. (O) 587
Fulton, J. F., on Richard Lower and John Mayow, 590 ; and Baumgartner, L., Morbus Gallicus (R) 1126
Fumigation, hydrogen cyanide, booklet on, 463
Furneaux's Human Physiology (W. A. M. Smart) (R) 558
Furunculosis in salmon (A) 1066

G

Gage, H. C., chronic duodenal ileus, 115
Gall-bladder—biliary drainage and (T. Hunt) 608, (D. L. Lewis) (C) 692 ; cancer of (A) 261 ; disease of, headaches and (Sir E. Spriggs) 1 ; disease of, pancreatic necrosis and (LA) 1063 ; white bile and (A) 1012, 1472
Gallipoli and Salonika Pilgrimage Committee, 406
Gall-stone obstruction—in common bile-duct (J. Taylor) 1140 ; in intestine, 1153
Gangrene—diabetic, 847 ; gassing and (J. B. McDougall and J. H. Crawford) 366, (O. Leyton) (C) 456

Gardiner-Hill, H., on obesity, 1238
Gardner, A. D., on whooping-cough, 250
Garland, H. G., gold treatment of rheumatoid arthritis, 8, (LA) 85
Gas, *see* Poison gas
Gas-and-air analgesia in midwifery (J. Elam) 1253, (PI) 1442
Gask, G. E., changing surgery, 982
Gastric, *see* Peptic ulcer and Stomach
Gauvain, Sir H., on sea-bathing, 1026
Gellatly, J. H. (O) 229
General elections—cathartic function of (LA) 1127; medical men as parliamentary candidates, 1091, 1202, 1272
General Medical Council—medical curriculum, revision of (LA) 511, 1425; penal cases, 1323, 1364, 1426; powers, duties, and constitution of, 465; presidential address, 1263; *see also* Medical Register
General paralysis of insane, clinical aspects of, 94
Genetics- [illegible] cott) 872; [illegible] f (A) 437; [illegible] und Vererl [illegible] l F. Buschke) (R) 136; hæmochromatosis, heredity and (R. D. Lawrence) 1055; Hered [illegible] (R) 13 [illegible] and ([illegible] (A) [illegible] inheritance of (L. S. Penrose) 192; *see also* Sterilisation, eugenic
Genito-urinary tract, *see* Urinary
Geoghegan, J., headaches (C) 158
Germany—criminal law, changes in (A) 565; German Pharmacological Society, 866; Jewish practitioners in (A) 1131, 1216; vaccination in, 114
Germicidal, *see* Mercurial
Gibberd, G. F., endotracheal insufflation of new-born (NI) 138
Gibson, A. G., on fatty infiltration of myocardium, 947, 1042
Gibson, J. M. (O) 1147
Gilbert, F. W., novarsenobenzene in anthrax, 1283
Gill, C. A., on malaria in Ceylon, 1077, 1177
Gillbard, R., on representation of members of Royal College of Surgeons, 1258
Gillespie, M., breathing exercises in asthma, 705
Gillies, Sir H., on plastic surgery of eyelids, 100
Girdlestone, [illegible]
Girode, C., [illegible] Traitemei [illegible] des membres (R) 1060
Glandular fever, 251
Glasgow University Club, London, 1148
Glaucoma (A) 201, 1139
Gledhill, T. N., monocytic leukæmia, 825
Glénard's disease (C. J. Marshall) 908
Glover, L. G., medical refugees' contribution to Royal Medical Benevolent Fund (C) 1208
Goadby, Sir K., agranulocytosis, 933, 1352
Goitre, *see* Thyroid gland
Gold—in asthma (L. Bansky) 79, (LA) 85, (G. P. G. Sobhy) (C) 156; in rheumatism (S. J. Hartfall and H. G. Garland) 8, (LA) 85, (G. Slot and P. M. Deville) (C) 157, (R. Ellis) (C) 276, punctate basophilia and (G. J. Griffiths and J. Race) 714; in tuberculosis, 8, (B. A. Peters and C. Short) 11, (C) 157, (LA) 85, (C. Shaw) (C) 105; purpura hæmorrhagica following (E. H. Hudson) 74, (LA) 85
Goldberg, B., Clinical Tuberculosis (R) 1124
Golf—Sussex Medical and Dental Golfing Society, 866
Golla, F. G., on nervous system, 945
Gonadotropic, *see* Sex hormones
Gonococcal—infections, T.A.B. vaccine in (A. H. Bartley) (C) 743, (J. J. Abraham) (C) 802; proctitis in females (P. A. Clements and K. E. A. Hughes) 18, (M. Rawlins) (C) 158; salpingitis, prognosis of (A. Bourne) (P) 331; stricture, sterility and (A) 1246; vaginitis, treatment of (L. H. Biskind) 1049, (A) 1070; *see also* Venereal disease
Goodall, E. W., fever hospitals (C) 1377
Goodwin, A., vaccination on the third day (C) 744
Gordon, A. K., hæmoglobin estimation (C) 744; myeloblastic leukæmia, 1292
Gordon, M. H., agglutination of virus bodies (C) 104
Gordon, R. G., on osteo-arthritis, 1005
Gordon syndrome, 874, (A) 895, 1190
Gordon-Taylor, G., hæmatemesis, surgery and, 811, (C) 972
Gordon-Watson, Sir C., arterial embolism (C) 1431
Gorell, Lord, breathing exercises in asthma (C) 1089
Gosse, P., Go to the Country, 1273; Memoirs of a Camp Follower (R) 1008
Gough, A., on ovariotomy, 1463
Gough, J., thrombosis of aorta, 21
Gould, E. P., prognosis of non-malignant diseases of breast (P) 899
Gout, pruritus and (Lord Horder) 287
Gow, A. E., appointment, 262
Graham, G., on insulin, 1235
Graham, J., and Clark, H. E., Elementary Textbook of Anatomy (R) 890
Graham-Little, Sir E., medical herbalists (C) 103; naturopaths (C) 343
Grant, A. C. (O) 1267
Grant, C. G. (O) 228
Graves's disease, *see* Thyroid gland
Graves, T. C., sinusitis and mental disorder (C) 1484
"Graveyard" Walker, work of, 285
Gray, C. H., on torticollis, 1257
Green, J. S., on toxæmias of pregnancy, 1137
Greenberg, L. A., and Haggard, H. W., Diet and Physical Efficiency (A) 729, 749
Greenwood, M., Epidemics and Crowd Diseases (R) 306
Greeves, R. Affleck, on glaucoma (A) 201
Grégoire, R., Chirurgie de l'œsophage (R) 832
Griffin, M., on tuberculous meningitis (LA) 950
Griffith, A. S., bovine phthisis, 1339
Griffiths, G. J., punctate basophilia after chrysotherapy, 714
Griffiths, H. E., Injury and Incapacity (R) 948, (A) 1133; prognosis in fractures of vertebral bodies (P) 439
Grocers' Company scholarships, 809
Guéniot, A., death of, 337
Guinane, J. V., on infantile paralysis, 638
Guirdham, A., prize, 93
Gunewardene, H. O., Heart Disease in Tropics (R) 375; High Blood Pressure and its Common Sequelæ (R) 1299
Gunn, J. A., [illegible] Pharmacology and [illegible]
Guy's Hospit [illegible]
Gwynne-Evan [illegible] (NI) 556
Gye, W. E., on cancer, 1315; proteolytic enzymes in cancer (C) 915
Gymnastics, *see* Physical education
Gynæcology—Eden and Lockyer's Gynæcology (H. Beckwith Whitehouse) (R) 23; hormone therapy in (L. Williams) 794; Introduction to Gynæcology (C. J. Miller) (R) 252; Practical Handbook of Midwifery and Gynæcology (W. F. T. Haultain and C. Kennedy) (R) 1466; Puerperal Gynæcology (J. L. Bubis) (R) 1465; *see also* Vaginitis

H

Hadfield, J. A., on maternal protection hypothesis, 1210
Hæmatemesis—surgery and (G. Gordon-Taylor) 811, (C) 972, (H. L. Tidy) (C) 915, 1030, (W. F. Neil) (C) 973, (H. W. S. Wright) (C) 973, (T. H. Sellors) (C) 973, (R. S. Aitken) (C) 973, (M. E. Shaw) (C) 1030, (M. Smyth) (C) 1090; treatment of, with food (E. Meulengracht) 1220, (J. J. Spira) (C) 1378, (J. B. Hunter) (C) 1431
[illegible] — Hæmochromatosis [illegible] 98; heredity and [illegible] 5 [illegible] 7 [illegible] viper venom in [illegible] vitamin C ir [illegible] neonatal intracranial, 1454; rectal, diagnosis of (A) 1067; subarachnoid (H. D. Pickles and A. H. Dunkerley) 1461; *see also* Hæmatemesis
Hæmorrhoids—Modern Treatment of Hæmorrhoids (J. F. Montague) (R) 196
Haggard, H. W., and Greenberg, L. A., Diet and Physical Efficiency (A) 729, 749
Hair and Scalp (A. Savill) (R) 1126
Hales, H. W., on obesity, 1239, (C) 1328
Hale-White, Sir W., Great Doctors of the Nineteenth Century (R) 1415; and Douthwaite, A. H., Materia Medica, Pharmacy, Pharmacology, and Therapeutics (R) 890
Hall, Sir A. J., prognosis in epidemic encephalitis (P) 147
Hall, E. W., on medical officer in preparatory school, 1177
Hall, John, life of, 1332
Halliburton, W. D., and McDowall, R. J. S., Handbook of Physiology (R) 1184
Hallux valgus and hallux rigidus, prognosis of (E. I. Lloyd) (P) 263
Hamilton, W. F., on artificial pneumothorax (LA) 1417
Hammer, N., Catechism of Air-raid Precautions, 1100
Hammond, T. E., Infections of the Urinary Tract (R) 721
Hand, anatomy of (A) 200
Handley, W. S., on paralytic ileus in acute appendicitis, 1120
Hankin, M., Doors of Hope, 591
Hansen, A. B., amidopyrin hypersensitivity and agranulocytosis, 1342
Hansman, F., on calcification, 843
Hare, D. C., allergic factor in colitis, 767; Cushing's syndrome, 118, (LA) 775
Hare, R., on puerperal infection (LA) 1302
Hargrave-Wilson, W., and Macdonald, G., Osteopathic Lesion (R) 670
Harman, N. Bishop, Science and Religion (R) 831
Harold, C. H. H., on London water, 1080 [illegible] rol of infection [illegible] 173, 233; on [illegible]
Harris, L. J., vitamin-C subnutrition, 1399
Harris, T. A. B., anæsthesia by closed method, 817
Harrison, W. L., on treatment of venereal disease, 134
Harrower, G., lipiodol therapy, 715
Hartfall, S. J., gold in rheumatoid arthritis, 8, (LA) 85
Hartog, Sir P., and Rhodes, E. C., International Institute Examinations Enquiry (LA) 1303
Hartsilver, J., fæcal incontinence, 427
Harveian Oration, 927, 1158
Haultain, W. F. T., and Kennedy, C., Practical Handbook of Midwifery and Gynæcology (R) 1466
Hauptmann's appeal, failure of (ML) 1023
[illegible] nktion [illegible] llular- [illegible] rtality, [illegible] 96
Hayes, D. S., anuria treated with spinal anæsthesia, 554
Hayes, W. I., on Cæsarean section, 788
Hay-fever (A) 201
Head—Head, Heart, and Hands in Human Evolution (R. R. Marett) (R) [illegible] W. R. [illegible] and [illegible] , (C) [illegible] uitary [illegible]
Heald, C. B., on electrotherapy, 1001
Healing—Healing Ritual: Studies in the Technique and Tradition of the Southern Slavs (P. Kemp) 751; *see also* Faith-healing
Health and Human Progress (R. Sand) (R) 1465
Health education—(A) 1470; animated cartoons for, 752; Body and its Health (W. Cullis and M. Bond) (R) 889; Doctor Talks, A (J. McDonnell) (R) 308; Everyman in Health and in Sickness (H. Roberts) (LA) 833; Health, and a Changing Civilisation (E. Obermer) (R) 137; Laugh and Grow Fit, 1447; Patient and Doctor (Sir H. B. Brackenbury) (R) 722, (A) 729, (LA) 833; practitioners and (Sir G. Newman) 1043; Some Methods of Health Education (M. B. Davies and L. Wilkes) 172
Health resorts—as national asset, 974; Pharmacological Action of Harrogate [illegible] Waters (W. Bain) (R) 307; [illegible] *also* British [illegible] alth [illegible] mune, and, 11[illegible] of, in experi- [illegible] B. Duguid) 421;

trematode infection of (A) 1015; *see also*—
Heart disease—auricular fibrillation, emetine and (I. A. Sayid) 556; coronary thrombosis, 1004; deaths from, analysis of, 1429; digitalis in (A. Fraenkel) 1101; endocarditis lenta (A) 383; endocarditis, oral sepsis and (C. C. Okell and S. D. Elliott) 869; heart-block, prognosis in (T. East) (P) 205; Heart Disease in the Tropics (H. O. Gunewardene) (R) 375: mortality from, influenza and (P. Stocks) 386. (D. Leys) (C) 581; myocardial deficiency, 946, 1042; osteo-arthropathy and (A) 895; paroxysmal tachycardia, acetylcholine in (A. B. Stenhouse) 1291; rheumatic (K. D. Wilkinson) 411, (A) 777, vitamin C and (C. B. Perry) 426, (LA) 432; *see also* Electrocardiography and Pericarditis
Hedblom's syndrome, 286
Heffernan, P., on industrialism and tuberculosis, 1295
Heggs, F. M., M.B., B.S. Finals, 926
Henderson. Y., artificial respiration (C) 217; depression of muscle tonus, 178
Henry, A. K., forceps for abdominal drainage (NI) 1414
Henry, J. N., on scarlet fever immunisation (LA) 773
Hepatic, *see* Liver
Hercus, C. E., on anaerobic toxæmias of animals, 963; on goitre, 787
Herd, H., on school medicine in the future, 863
Herd immunity (LA) 141
Heredity, *see* Genetics and Sterilisation, eugenic
Hernia, epigastric (H. F. W. Warden) (C) 637
Herpes—facialis, epidemic of (J. C. Bridge) (C) 158; zoster (E. W. Hurst) 700, 910, bilateral (P. W. Hutton) 302
Hertzler, A. E., and Chesley, V. E., Diseases of the Thyroid Gland (R) 772
Herzfeld, G., prognosis in congenital stenosis of pylorus (P) 385
Heseltine, M., Medical Register (C) 1328
Hewlett, R. F. L., agranulocytosis, amidopyrin and, 1347; congenital malaria, 369
Hill, Sir L., artificial respiration (C) 277: Manual of Human Physiology (R) 1062; measuring airway of nose, 70; on benefits of bracing climate. 791; ultra short waves (C) 158
Hinden, E., U wave of the electrocardiogram, 1228
Hinman, F., Principles and Practice of Urology (R) 136
Hinton. J. P., and Calcutt, J. E., Sterilisation: A Christian Approach. 751
Hipsley, P. L., on intussusception, 1197
Histidine in peptic ulcer. 579
History—British Scientists of the Nineteenth Century (J. G. Crowder) (R) 196; History of Science, Technology, and Philosophy in the Sixteenth and Seventeenth Centuries (A. Wolf. F. Dannemann, and A. Armitage) (R) 195
History, medical—Account of the Deaths of the Rulers of England (M. Yearsley) (A) 1471; Atslowe, Edward (R. R. James) 1445; Beddoes, Thomas Lovell, poet (A) 1360; Bellers. John (A. R. Fry) (R) 1183: Brodie. Benjamin (H. E. Mansell) 408; century of (Sir G. Newman) 1043; Cornaro. Luigi. 646; Ehrlich, Paul, 449; Fracastor: Syphilis or the French Disease (H. Wynne-Finch and J. J. Abraham) (A) 89: "Graveyard" Walker. work of, 285; Great Doctors of the Nineteenth Century (Sir W. Hale-White) (R) 1415; Hall, John, 1332; Harvey, W., work of (Sir H. Dale) 927; History of Science, Technology. and Philosophy in the Sixteenth and Seventeenth Centuries (A. Wolf. F. Dannemann, and A. Armitage) (R) 195; Hodgkin's disease (A) 1134; Ingleby, J. T. (A) 438; International Congress of History of Medicine, 848; Jackson, Hughlings, 335, (A) 316: King's and some King's Men (H. W. Lyle) (A) 89; Lower R., 590; Magnan. V., work of, 579; Mayow, J., work of. 590; medical authors in thirteenth century. 646; medical defence (LA) 560; medical research (Sir H. Dale) 927; Medicine in Persia (C. Elgood) (R) 26; orthopædic surgery, 770; regius chair of physic at Cambridge. 694; scurvy, infantile (LA) 431; Smollett on spas (A) 776; Stark, W., work of (J. C. Drummond and A. Wilbraham) 459, (LA) 431; Story of Middlesex Hospital Medical School (H. C. Thomson) (R) 251; surgery. changes in (G. E. Gask) 982; variolation and vaccination, 943; Williams, John Whitridge (A) 1421
Hitchcock, D. I., Physical Chemistry (R) 137
Hoagland, H., Pacemakers in Relation to Aspects of Animal Behaviour (R) 772
Hobday, Sir F., on relief of animal suffering (A) 436
Hodgkin's disease—ætiology of (A) 895, 1190; histology of (A) 1134; in Nigerian natives (E. C. Smith) 874; test for, 874. (A) 895, 1190; X rays in (G. E. Vilvandré) 1265
Holiday, E. R., hæmoglobin estimation, 661
Holland. E., prognosis of Cæsarean section (P) 1135
Holland, Sir T., on medical curriculum, 1029
Hollick, J. O., epidemic of sore-throat (C) 860
Holmes, J. M., aplastic anæmia. 71
Holmes, J. McD., on cancer of lung (LA) 620
Holmes, M. J., on cancer control, 637
Holten, C., amidopyrin hypersensitivity and agranulocytosis, 1342
Holzer, W., and Weissenberg, E., Grundriss der Kurzwellentherapie (R) 1125
Honours, 1095, 1388, 1473. 1493
Hookworm, malaria and (A) 382
Hopkins. Sir G., on national food policy (A) 1305; preparation of pharmacist, 797
Hopkinson, H. C., ruptured urethra, 428
Horder. Lord, medical education, 987; on maternal mortality, 96; on thyrotoxicosis. 786; pruritus, 287
Horgan, E. S., moles and melanotic sarcoma (C) 156
Hörlein, H., on chemotherapy (A) 840
Hormones—research on (Sir H. Dale) 927; *see also* Endocrine system and Sex hormones
Horner, N. G., stickit doctor. 1039
Horsley memorial lecture, 1155
Horwood. M. P., and Prescott, S. C., Sedgwick's Principles of Sanitary Science and Public Health (R) 1061
Hosford, J. P., cysts of semilunar cartilage of knee, 1166
Hospital contributory schemes—Australian (LA) 671; Hull. 641; Royal Worcester Infirmary, 1029; Walsall General Hospital. 349
Hospital pay-beds (PI) 53, 271, 747, 1390
Hospitals—almoners. qualifications of (PI) 222; British Medical Association's report. 264; camp into hospital, 1493; Cheshire isolation. 585. 687; chronic patients in, 887, (A) 897; Diet Book of the David Lewis Northern Hospital, Liverpool, 1100; Dublin maternity, reports of (A) 563; fever. 808, (A) 1308, (E. W. Goodall) (C) 1377; Hereford, new hospital at, 1149; Herne Bay, new hospital for, 906; Hospital Sunday, 1464; Irish Hospitals Commission. 688; libraries in. 1149; Liverpool Voluntary Hospitals Board. 90; Local Government Act and (A) 897; London (LA) 86, 403; London County Council, 275, 1035; Lotteries Act and (PI) 165; Manchester. liaison between, 452, 956; maternity, in America (K. V. Bailey) 1213; maternity, of future (M. H. Phillips) 1107; medical administration in (LA) 309, (D. G. Morgan) (C) 634, (B. A. Perott) (C) 744; milk for (PI) 54. 347; modified plan for (E. R. Carling) 1314; Newcastle, extensions of, 588; paratyphoid in staff, 50, 805; pensioners in (PI) 979, 1032. 1033, 1488; pharmacopœias, 695; Quetta, 1268; rates and (LA) 1467; Scottish, 1084; slippery floors in (ML) 214; telephone charges and (PI) 1488; Voluntary Hospitals (Paying Patients) Bill (PI) 53, 1441; voluntary. in special areas (PI) 1442; Wakefield. new hospital for, 922; wards, children's, infection in (E. H. R. Harries) 173, 233; wards, dimensions of, 172; wards. streptococcal infection in (LA) 834; wireless sets for, 692

HOSPITALS.—Aberdeen Maternity Hospital, 809—Battersea General Hospital: 269: name of, 1211, (LA) 1245. (ML) 1257—Birmingham Children's Hospital, 729—Birmingham General Hospital, 1209—Borough Hospital, Southampton, 866—Bristol Eye Hospital, 1055—Cardiff Royal Infirmary, 406—Central London Throat, Nose, and Ear Hospital. 262, 641. 747—Charing Cross Hospital: 693; dinner, 865—Christie Hospital and Holt Radium Institute. Manchester. 1493—Coventry and Warwickshire Hospital, 588, 922—Crewe Memorial Hospital, 406—Cumberland Infirmary, 809—Devizes and District Hospital. 1342—Dundee Royal Infirmary, 286—Durham County Hospital, 696—East Suffolk and Ipswich Hospital, 588—Edinburgh Royal Infirmary, 230, 330, 1318—Essex County Hospital, Colchester. 922—Grove Hospital, Tooting, 1390—Guy's Hospital: asthma clinic (A) 317; children's play clinic. 1037; fracture clinic (A) 318; lectures, 866; pay-beds, 1390—Hampstead General and North-West London Hospital, 865—Hertford Hospital. Paris, 57—Huddersfield Royal Infirmary, 752—Hull Royal Infirmary. 406. 1095—Infants Hospital, 1148—Ingham Infirmary, South Shields. 1438—Kent and Canterbury Hospital, 178—Kent and Sussex Hospital, 603—Kettering General Hospital, 747—King Edward VII. Hospital, Windsor, 1085—King George Hospital, Ilford. 403—King's College Hospital: 349, 406. 641, 692; centenary. 349; dinner. 865; King's and some King's Men (H. W. Lyle) (A) 89; Listerian Society, 1039—Lady Chichester Hospital. Hove, 922—Leeds Public Dispensary and Hospital, 693—Llanelly Hospital, 688—London Hospital: 641, 1136; dinner, 980; lectures, 127, (A) 955—London Jewish Hospital, 1000—Manchester Babies' Hospital, 1095—Manchester Royal Infirmary, 747—Mansfield Orthopædic Hospital, Northampton, 914—Marie [illegible] an Hospital [illegible] dinner, [illegible]; rates, [illegible] studentship, 1269—Mile End Hospital, extensions, 58—National Hospital, Queen-square. 349, (LA) 952—National Hospital for Diseases of the Heart, 539, 597, (LA) 621—Newquay Hospital, 747—New Sussex Hospital for Women and Children, 204—North Devon Infirmary, 406—Northern Women's Hospital. Newcastle-upon-Tyne. 1136—Nottingham General Clinic, 58—Nuneaton General Hospital, 1438—Paddington Hospital. 417—Plymouth City Hospital, 1037—Princess Beatrice Hospital. London, 62—Princess Elizabeth of York Hospital, 231—Putney Hospital for Incurables. 406—Queen Alexandra's Hospital for Officers. 1329—Queen Charlotte's Maternity Hospital, 1320—Queen Mary's Hospital for the East End, 1294—Radcliffe Infirmary, Oxford, 641—Royal Buckinghamshire Hospital, 1260—Royal Dental Hospital: 284, 747, 921, 1148; clinical At Home, 1261; dinner, 1262; opening address, 856—Royal Eye Hospital, 693—Royal Free Hospital: 808; dinner, 1329—Royal Manchester Children's Hospital, 835—Royal Mineral Water Hospital, Bath, 428—Royal Victoria Hospital. Belfast, 970—St. Bartholomew's Hospital: dinner, 1065; extension. 561: reports (A) 1067—St. George's Hospital: 1148: rebuilding donation, 835—St. James Hospital, Leeds, 740—St. John's Hospital for Diseases of the Skin, 1444—St. Mary's Hospital, dinner. 807—St. Paul's Hospital, London. 747—St. Thomas's Hospital, dinner, 865—Sevenoaks Children's Hospital, 747—Stratton Cottage Hospital, 641—Stroud Public Assistance Institution. 1328—Sussex Eye Hospital, 113—Swindon Victoria Hospital, 642—Tewkesbury Hospital. 406—Three Counties Hospital, Arlesey, 406—Tonbridge Cottage Hospital, 1031—Watford Peace Memorial Hospital, 67—West Suffolk General Hospital, 1072—Westminster Hospital: dinner, 807; new building, 55, 1314; radium bomb, 652, (A) 675; radium tell-tale, 868; slippery floors in, damages for (ML) 214; suggested lay-out for new building (E. R. Carling) 1314

Hospital Saving Association, report. 1268
Housing—advisory committee. 1211; Artificial Sunlight (M. Luckiesh) (A) 1189; balconies for working-class flats (PI) 164; chorea and (G. F. Walker) 553; dilapidated dwellings, repair of (PI) 1442; Housing Act (PI) 164, 862; in Scotland (PI) 52,

108 ; No Mean City : A Story of the Glasgow Slums (A. McArthur and H. K. Long) (R) 1007 ; overcrowding (PI) 1383, 1384, 1489 ; Rebuilding of Manchester (Sir E. D. Simon and J. Inman) (A) 677 ; schemes, surgery accommodation and (PCP) 162
Howard, C., proctalgia fugax (C) 313
Howarth, W., on acute frontal sinusitis, 1350 ; prognosis in middle-ear suppuration (P) 1071
Hubble, D., dosage of alkali (C) 634
Hudson, E. H., purpura hæmorrhagica, 74, (LA) 85
Hughes, D. E. R., on physique in industry (LA) 199
Hughes, K. E. A., gonococcal proctitis, 18
Hultkrantz, J. W., Brain Preparations (R) 1353
Hume, C. W., electric shock and subjective sensation, 1021, (LA) 1010
Humerus, internal epicondyle of, fractures of, 1257
Humidity, cough and (G. C. Pether) (C) 971
Humphreys, W. C. (O) 859
Hunt, J. R., Davis, T. K., and Frantz, A. M., Biology of the Individual (R) 1182, (A) 1189, 1300
Hunt, T., biliary drainage, 608
Hunter, D., on obesity, 1238
Hunter, J., death of (A) 204
(C) 1431

la (C) 1145 ; sterility and psychoneuroses following lumbar sympathectomy (C) 105 ; ulcerative colitis, prognosis in (P) 1194
Hurst, E. W., neurotropic virus diseases, 697, 758
Hutchison, R., and Wauchope, G. M., For and Against Doctors (A) 1191, 1216
Hutt, C. W., and Thomson, H. H., Principles and Practice of Preventive Medicine (R) 557
Hutton, P. W., bilateral zoster and zoster varicellosus, 302
Hydatid disease, 844
Hydrocephalus, 332
Hydrogen cyanide fumigation, booklet on, 463
Hygiene—Hygiene and Sanitation (J. F. Williams) 61 ; *see also* Health education and Public health
Hypertension, *see* Blood pressure, high
Hypnotics, *see* Insomnia
Hypopharyngeal cancer, combined distance radiation of (S. Cade and F. M. Allchin) 652, (A) 675
Hypothalamic, *see* Brain

I

(LA) 1129
1120 ; duodenal,
H. C. Gage) 115
Illumination—Artificial Sunlight (M. Luckiesh) (A) 1189
Immunisation—against neurotropic virus diseases (E. W. Hurst) 758 ; British Medical Association report on, 210
Immunity, herd (LA) 141
Imperial Cancer Research Fund, annual report, 1315
Impetigo, prognosis in (H. W. Barber) (P) 35
Impostors, 286, (ML) 630, 687, 1437
Impotence, nullity and, 1233
Imrie, A. H., aplastic anæmia following neokharsivan, 73
Incapacity, *see* Injuries
Incontinence, fæcal (J. Hartsilver) 427
India — All-India Ophthalmological Society, 227 ; Bombay in the Days of George IV. (F. D. Drewitt) 1099 ; Calcutta School of Tropical Medicine (A) 564 ; Dufferin Fund (A) 142 ; epidemic dropsy in (A) 1360 ; juvenile rheumatism in (A) 146 ; *see also* Quetta
Individual—Biology of the Individual (J. R. Hunt, T. K. Davis, and A. M. Frantz) (R) 1182, (A) 1189, 1300
Industrial Health Research Board—accident proneness (LA) 257 ; physique in industry (LA) 199
Industrial medicine—accidents, increase of (PI) 55, 1384, (A) 1362 ; carbon disulphide, dangers of (A) 1469 ; certifying factory surgeon, 1388, (A) 1362 ; child labour in fields (PI) 51 ; developments in (LA) 377 ; factories and workshops, Chief Inspector's report 98, (PI) 223 ; nervous disorder and (A. Lewis) 293, (LA) 311 ; nitrous fumes, risks of (A) 623, (PI) 1033 ; overseas medical officers, 229 ; peptic ulcers, working capacity after (H. H. Bashford and W. L. Scott) 710 ; schedule of diseases (PI) 224 ; silicosis, radiography of, 1198 ; tuberculosis and, 1295 ; two-shift system (A) 31 ; vocational filter, 866 ; volatile solvents, toxicity of, 263, (A) 675 ; Weil's disease in sewer-worker (J. Maxwell) 998 ; young workers, health of, 1388, (A) 1362 ; *see also* Industrial Health Research Board, Injuries, and Miners
Industrial Welfare Society, 378, 864
Infantile paralysis, *see* Poliomyelitis
Infant mortality—causes of (J. M. Smellie) 1453 ; hæmophilia and (W. J. Rutherfurd) (C) 1378 ; in Austria, 396 ; in nineteenth century (A) 726 ; statistics of (PI) 166, 221 ; *see also* Vital statistics
Infants—air-swallowing in (A) 1069 ; diseases of, course in, 1148 ; feeding of, morbidity and (A) 258 ; Infant Nutrition (W. M. Marriott) (R) 1466 ; malaria, congenital, in (N. C. Tanner and R. F. L. Hewlett) 369 ; morphine poisoning in (A. Renshaw) 132 ; new-born, respiratory diseases in (A) 1422, 1454 ; pooled human milk for (A) 314, (R. Lightwood) (C) 405 ; pyloric stenosis in, prognosis in (G. Herzfeld and H. L. Wallace) (P) 385 ; tetanus neonatorum, avertin in (L. Cole) 246, (LA) 256 ; torsion of spermatic cord in (G. F. Langley) 181 ; urinary infections in (A) 1306 ; vaccination of (D. Paterson) (C) 691, (A. Goodwin)

537, 585, 639, 692, 745, 806, 864, 914, 969, 1035, 1093, 1144, 1206, 1270, 1319, 1384, 1440, 1490
Infectious diseases—chief medical officer's report, 913 ; conference on, 1429 ; encephalitis and (E. W. Hurst) 758 ; Epidemics and Crowd Diseases (M. Greenwood) (R) 306 ; failure to notify (ML) 395 ; herd immunity and (LA) 141 ; hospital treatment of (A) 1308, (E. W. Goodall) (C) 1377 ; in East, 902 ; in Iceland (LA) 1129 ; in schools, old books and (PI) 1442 ; mortality from, influenza and (P. Stocks) 386, (D. Leys) (C) 581 ; study of, biological approach to, 1001 ; ward infection and (E. H. R. Harries) 173, 233
Infibulation (J. M. Melly) 1272
Influenza—epidemics of, certified causes of death and (P. Stocks) 386, (D. Leys) (C) 581 ; virus of (LA) 27
Infra-red rays—in tuberculous sinusitis (W. A. Troup) 667 ; sensitisation to (A) 315
Ingleby lectures, 411, (A) 438
Ingram, J. T., dye dermatitis, 239
1454 ; endotracheal
Gibberd and J. B.
Inhalation Therapy
Collison) (R) 375 ;
(A) 956 ; oxygen
A) 1358
of, 1117, (A) 1133 ;
Disabled (H. H.
(A) 1133 ; Injury
and Incapacity (H. E. Griffiths) (R) 948, (A) 1133 ; to face and jaw, in warfare (A) 144 ; *see also* Fractures
Inman, J., and Simon, Sir E. D., Rebuilding of Manchester (A) 677
tosis, amidopyrin
arm, inquest pro-
40, 687 ; hearsay
evidence at (ML) 339 ; mines inspectors at (PI) 281 ; on prehistoric man (ML) 631 ; tetanus death, post-operative (ML) 577 ; *see also* Coroners
Insomnia—drugs for, 1074, (LA) 1187 ; Insomnia and other Disturbances of Sleep (E. Miller) (R) 137 ; raw eggs for (I. Singh) (C) 636 ; sleep and (LA) 1187
Institute of Medical Psychology—appointment, 248 ; courses, 641 ; lectures for parents, 921 ; museum of toys, 1444 ; psychological conceptions, 829, (A) 837
Insulin—free (PI) 1384 ; hypertension and (L. N. Jackson) 350, (C) 582, (G. M. Wauchope) (C) 401 ; in malnutrition and infection (LA) 561 ; pocket-case for, 410 ; use and abuse of, 1235 ; *see also* Diabetes
Insurance—against broken spectacles, 1389 ; against prolonged illness, 926 ; in Austria, 215 ; in Jugoslavia, 1491 ; *see also* Hospital contributory schemes and—

INSURANCE, NATIONAL HEALTH (*see also* Panel and Contract Practice).—American misconceptions of (A) 1132—British Medical Association on, 211—Llanelly dispute, 207, (A) 955—Mortgage of practices (PI) 54—National Health Insurance Act (PI) 109, 164, 1032,
(PI)
Norris
and (S
contri

Intelligence—Range of Human Capacities (D. Wechsler) (LA) 1356 ; tests of, 1448
Intestine—large, ulcer of (R. A. Kerr) 550 ; obstruction of, by gall-stone, 1153 ; rotation of, anomalies of (E. L. Rubin) 1222 ; self-performed enterectomy (T. C. Astreos) 191 ; stercoraceous ulcer, perforation of (J. J. O'Reilly) 1175 ; tuberculous, perforation of (D. B. Rosenthal) 882 ; *see also* Colon, Ileus, and Intussusception
Intracranial—hæmorrhage (H. D. Pickles and A. H. Dunkerley) 1461, neonatal, 1451 ; hydrocephalus, 332 ; injuries, epilepsy and (C. P. Symonds) 1217 ; sphenoidal sinusitis and pituitary gland, 1026 ; thrombosis, post-operative, in childhood (P. R. Evans) 8 ; *see also* Brain
Intranatal, *see* Fœtal
Intravenous solutions, administration of (J. E. McCartney) 1476
Intussusception—1197 ; irreducible (A. Elliot-Smith) 992, (A) 1016 ; Meckel's diverticulum and (G. Duncan) 1174
Invalid Children's Aid Association, 1117
Iodine, estimation of (A) 384

IRELAND, CORRESPONDENCE FROM.—Anæsthetics, fees for, 792—Belfast
hospit
medic
A. F.
J. T.,
sion,
treatment of, 450—Irish Hospitals sweepstake, 395, 1029, 1318—Nurses, pension scheme for, 1204—O'Brien, C. M., death of, 395—O'Flaherty, P. E., death of, 970—Pringle, H.,

Belfast, 970

Irish Free State Medical Union, 1095
Irish Medical Schools and Graduates' Association, 1269
Isaacs, S., Psychological Aspects of Child Development, 695
Italy, tuberculosis in (A) 1361
Ivory Cross National Dental Aid Fund, 1309

J

Jackson, C., on cancer of larynx (LA) 1186
Jackson, Hughlings—doctrines of, motor cortex and, 335 ; foreign tributes to (A) 316
Jackson, L. N., persistent high blood pressure, 350, (C) 582
Jacobs, H., on gonococcal infections (A) 1070
James, C., peptic ulcer in Solomon Island native, 304
James, R. R., Edward Atslowe, M.D., 1445
James, S. P., on malaria, 631
Jamieson, E. B., and Brash, J. C., Cunningham's Manual of Practical Anatomy (R) 832
Jaundice—acholuric (A. M. Scott) 872 ; hæmolytic, 847 ; *see also* Weil's disease
Jaw, injuries to, in warfare (A) 144

Jejunal ulcer, prognosis in (R. P. P. Davies) (P) 678, (A. F. Hurst) (C) 1145, (T. Warwick) (C) 1432
Jelliffe, S. E., and White, W. A., Diseases of the Nervous System (R) 1183
Jenkins, W. D., on industrial medicine (LA) 378
Jewish—health organisation, 1149 ; medical students in Rumania, 338, 736 ; practitioners in Germany (A) 1131, 1216 ; practitioners in Palestine (PI) 1441 ; *see also* Refugees
Johns, A. M., on puerperal infection (LA) 1302
Johnson, S., psittacosis, 373
Johnston, T. B., Gray's Anatomy (R) 1007
Joint Council on Midwifery, 210, 219, (LA) 1009, 1088
Joints—infections of, 1119 ; pulmonary osteo-arthopathy (A) 895 ; *see also* Injuries and Rheumatism
Joint Tuberculosis Council, 1329
Jones, E. W., on coronary thrombosis, 1004
Jones, F. W., on judicial hanging, 985
Jones, H. W., on coronary thrombosis, 1004
Jones, Sir R., commemoration portrait of, 641
Jones, R. W., on bone and joint infections, 1119 ; Smith-Petersen nail (C) 217
Jones, W. H. (O) 278
Jones-Davies, T. E., botulism, 717
Jordan, A., congenital defect of sternum, 877
Jordan, E. O., Textbook of General Bacteriology (R) 948
Journals, medical (A) 955

JOURNALS (reviewed).—Archives of Disease in Childhood (LA) 431—British Journal o[illegible] 618—British Jo[illegible] 1008, (LA) 101[illegible]-Quarterly Journal of Medicine, 308, 1062—St. Bartholomew's Hospital Reports, 890, (A) 1067

Judi[illegible]
Jung[illegible] co[illegible]
Jupe, M. H., on ventriculography, 1368

K

Kay, H. D., on test for pasteurised milk (LA) 29, (A) 200
Kaye, G. W. C., on forty years of radiology, 1367
Kearton, C., Adventures with Animals and Men, 172
Kefalas, A., What of the Child ? (R) 376
Kekwick, A., method of bleeding transfusion donors, 78, (C) 218
Kelly, P. J., on venereal disease problems, 135
Kemp, P., Healing Ritual : Studies in the Technique and Tradition of the Southern Slavs, 751
Kennaway, E. L., on carcinogenesis (A) 1249
Kennedy, Bishop James, skeletal remains of, 1152
Kennedy, C., and Haultain, W. F. T., Practical Handbook of Midwifery and Gynæcology (R) 1466
Kenya natives, cancer in (F. W. Vint) 628
Kerr, D., Forensic Medicine (R) 24
Kerr, M., on maternal mortality, 1254
Kerr, R. A., simple ulcer of large bowel, 550
Kerridge, P. M. T., hæmoglobin estimation, 661
Kessler, H. H., Crippled and the Disabled (R) 537, (A) 1133
Ketogenic diet, 127, (LA) 140
Kidney—anoxæmia and (R. A. McCance) 370 ; congenital abnormalities of (I. B. Barclay and J. B. Baird) 1169 ; cortical necrosis of, in pregnancy (A) 1306 ; Kidney in Health and Disease (H. Berglund and G. Medes) (R) 23 ; *see also* Nephritis and Urinary infections
Kilvington, B., on calcification in hydatid cysts, 845
King Edward's Hospital Fund, 16, (LA) 86, (A) 1193, 1270, 1490
King's and some King's Men (H. W. Lyle) (A) 89
King's College Hospital Medical School (A) 896, 961
Kingston, F. E., scabies in mental hospital, 815
Kinsella, V. J., dysostosis cleidocranialis, 303
Knee-joint—internal derangement of (R. C. Elmslie) (P) 1251, cruciate ligaments and (A) 384, 1132 ; semilunar cartilage of, cysts of (J. P. Hosford) 1166
Knuthsen, L. F. R., appointment, 204
Kohiyar, A. J., Medical Case-taking and Diagnosis (R) 137
Krzywicki, L., Primitive Society and its Vital Statistics, 60
Kwashiorkor (C. D. Williams) 1151, (H. S. Stannus) (C) 1207
Kymography, surgery of phthisis and (LA) 432

L

Lactation—delayed (W. B. Crawford) (C) 1208 ; lactose, synthesis of (A) 1248
Lactobacillus Acidophilus (L. F. Rettger, M. N. Levy, L. Weinstein, and J. E. Weiss) (R) 721
Lambie, C. G., on obesity, 846
Landry's paralysis (E. W. Hurst) 700
Lane, C. R., agranulocytosis 20 ; botulism, 717, (C) 1377
Lane, T. J. D., drain introducer (NI) 254 ; stomach-holding forceps (NI) 253
Lane-Claypon, J., on independent midwife (LA) 1009
Langdon-Brown, Sir W., fear and pain, 911 ; integration of endocrine system, 1155 ; on acceptance of glycosurics, 270 ; on birth control, 1181 ; on changing conceptions of disease, 970
Langley, G. F., torsion of spermatic cord in infancy, 181
Larynx—cancer of (LA) 1186, sputum from (A) 1247 ; direct inspection of (N. Patterson) 1019 ; foreign bodies in (V. E. Negus) (P) 730 ; laryngoscope, detachable (J. Elam) (NI) 616 ; Recent Advances in Laryngology and Otology (R. S. Stevenson) (R) 1298 ; tuberculosis of, ultra-violet light therapy in, 1026
Laugh and Grow Fit, 1447
Laurie, A. H., on new source of hormones (A) 1189
Lauwers, E. E., Introduction à la chirurgie thoracique (R) 1184
Lawrence, H., on skin diseases in Australia, 1073
Lawrence, R. D., hæmochromatosis and heredity, 1055 ; on insulin, 1235
Layton, T. B., acute frontal sinusitis, 1345

LEADING ARTICLES
Accident proneness, 257—Administrators, medical, 309—Age, personality and, 672—Artificial pneumothorax and after, 891—Artificial respiration, 139—Aspirin and sodium salicylate, use of, 619—Assessors, medical, 774—Asthma, 379
Barlow, Sir Thomas, 431—Battersea General Hospital, 1245—Blood regeneration, 312—Botulism, 559—Bovine pleuropneumonia, 1064—Bovine vaccination against tuberculosis, 892
Cancer of : larynx, 1186 ; lung, 620—Charlatanism, 1186—Contract practice, 255—Curriculum, medical, 511—Cushing's syndrome, 775
Diploma in Child Health, 773
Electric shock, 1010—Examinations, 1303
Forceps operation, 725
Gastroscopy, 1244—General elections, 1127—Gold treatment, 85
Hæmostasis in hæmophilia, 893—Health education, 833—Herd immunity, 141—Hospital insurance system, 671—Hospitals and the rates, 1467—Hospitals, large and small, 86
Iceland, public health in, 1129—Industrial medicine, 377—Influenza virus, 27—Insulin in malnutrition and infection, 561
Kymography and the surgery of phthisis, 432
Medical defence, 560—Medicine and the Welsh language, 835—Medicine as a useful art, 1468—Medicine, renaissance of, 1301—Mentally defec[illegible] independent, [illegible], 29—Mind [illegible] of women, 1357—Myopia, 1418
Nervous disablement in war and industry, 311—Nervous system, research on, donations to, 952—Nutrition, assessment of, 951
Osteopaths Bill, 197—Otorrhœa, control of, 724
Pancreatic necrosis, acute, 1063—Parenteral liver in sprue, 1127—Pharmaceutical sterilisation, 28—Physique in industry, 199—Pick's disease, 621—Plaster technique, 723—Pleural shock, air embolism and, 1417—Post-mortem technique, 198—Preventive outlook, 949—Psychology, medical, teaching of, 1185
Quackery, 1186
Scarlet fever immunisation, 773—School-children, detection of defects in, 197—Secret remedies, 83—Sex hormones, 1467—Singer's nodule, 27—Sleep and sleeplessness, 1187—Squint, 378—Streptococci : burns infected with, 834 ; puerperal infection and, 1302—Surgeon, use of word, 1128—Sympathectomy, 1011
Testis, undescended, 1355—Tetanus, 256—Trachoma, 434—Trichomonas vaginitis, 1417—Tuberculous meningitis, 950—Tuberculous peritonitis, 310
Urinary infection, 140
Variability of man, 1356—Venereal diseases, 1243
Whooping-cough, 377—World's surface, 620

Lead poisoning (PI) 224
League of N[illegible] 016 ; nutrition [illegible] (A) 1305, 142[illegible]y of, 341 ; tr[illegible] amin standards (A) 143 ; *see also* Dangerous drugs
Learmonth, J., appointment, 566
Ledingham, J. C. G., agglutination of virus-bodies (C) 45 ; on clinically allied viruses, 913
Lee, E. S., Henry and Jouvelet's pump, 1242
Leeds School of Medicine, 1330
Leg, arterial obstruction in (G. Williams) 1020, (G. R. Girdlestone) 1231, (Sir C. Gordon-Watson) (C) 1431
Leipoldt, C. L., medicine and faith, 1494
Leonard, W. Ellery, work of, 592
Leopard bite (J. Walker) 133
Leprosy, nutrition and (A) 203
Leptospiral jaundice, *see* Weil's disease
Le Riche, P. J. (O) 403
Lettsomian lectures (A) 674
Leukæmia—monocytic (T. N. Gledhill) 824 ; myeloblastic (J. H. Ward and A. K. Gordon) 1292
Leverhulme Research Fellowships, 169
Leveuf, J., Girode, C., and Monod, R.-C., Traitement des fractures et luxations des membres (R) 1060
Levi, D., cleft palate (C) 105
Levinthal, W., psittacosis, 373
Levy, L. F., on vitamin-C content of native foodstuffs (A) 1470
Levy, M. N., Rettger, L. F., Weinstein, L., and Weiss, J. E., Lactobacillus Acidophilus (R) 721
Lewis, A., neurosis and unemployment, 293, (LA) 311 ; on obsessional illness (A) 1420
Lewis, D. L., biliary drainage (C) 692
Ley, L., stones in hepatic duct, 249
Leys, D., death certification (C) 581 ; pneumococcal meningitis, 190 ; serum treatment of pneumonia, 67
Leyton, O., thrombo-angiitis obliterans (C) 456
Lichtenhahn, F., death of, 417
Liebesny, P., Kurz- und Ultrakurzwellen (R) 1125
Life assurance—International Medical Congress on, 269
[illegible] ML) 339 [illegible] Luckiesh) [illegible] Treatment, [illegible] Anderson) [illegible] 315
Lightwood, R., diseases of childhood, 851 ; pooled human milk (C) 405
Lindhard, J., Theory of Gymnastics (R) 25
Lipiodol therapy (G. Harrower) 715, (A. Piney) (C) 802

Little, E. M. (O) 858
Liver—cancer of (J. A. Martinez) 1293 ; gall-stones operation and (J. Taylor) 1140 ; hepatic duct, stones in (L. Ley) 219 ; water and fat metabolism and (H. Selye, J. B. Collip, and D. L. Thomson) 297 ; white bile and (A) 1012
Liver therapy—in sprue (LA) 1127 ; *see also* Anæmia, pernicious
Livingston, W. K., Clinical Aspects of Visceral Neurology (R) 24
Livingstone, J. L., breathing exercises in asthma, 705 ; high blood pressure, treatment of, 961
Llanelly dispute, 207, (A) 955
Lloyd, E. I., director for Smith-Petersen nail, 129 ; prognosis of hallux valgus and hallux rigidus (P) 263
Lloyd, W. E., medical treatment of pulmonary tuberculosis, 852
Lloyd Roberts lectures, 693, 783, 1130, 1236, (A) 1305
Local authorities—Century of Municipal Progress (R) 1006 ; chronic sick, provision for, 887 ; hospital services under (A) 897 ; *medical administrators and* (LA) 309, (D. G. Morgan) (C) 634 ; mental deficiency and, 685, (LA) 672 ; specialist medical treatment and (PI) 51
Lockhart, L. P., origin of boils (C) 861
Lockhart-Mummery, J. P., resection for carcinoma of sigmoid and sigmoid rectum (C) 1207
Locomotive God (W. E. Leonard) 592
Locust, problem of (A) 623
London—New Survey of London Life and Labour (Sir H. Llewellyn Smith) 59 ; water, 1080
London Association of the Medical Women's Federation, 342
London County Council—chronic sick, provision for, 887, (A) 897 ; hospitals, 172, 275, (A) 897, 1035 ; married medical women (A) 146 ; midwives, service of (LA) 1009 ; nutrition centres, 276 ; otorrhœa, report on (LA) 724 ; oxygen tents (A) 1358 ; squint training clinic (
London 169,
281, 7.
London Medical Exhibition, 975, 1024
London School of Dermatology, 587
London School of Hygiene and Tropical Medicine, 780, (A) 1069, 1149
London School of Medicine for Women—dinner, 1148 ; opening address, 855 ; scholarships, 231
Long, H. K., and McArthur, A., No Mean City : A Story of the Glasgow Slums (R) 1007
Longevity, *see* Old age
Lossen, H., Groedel's Röntgendiagnostik in der Inneren Medizin (R) 890
Lotteries for hospitals (PI) 165
Lourdes pilgrimage, typhoid fever epidemic and, 406, 452
Lovibond, J. L., macrocytic hæmolytic anæmia, 1395, (A) 1423
Low, G. C., on tropical medicine, 901
Lowe, T. P., on Charcot's bath, 114
Lowenfeld, M., Play in Childhood (R) 721
Lower, R., work of, 590
Lucas, A., Forensic Chemistry and Scientific Criminal Investigation (R) 1007
Luck, J. M., Annual Review of Biochemistry (R) 617, 696
Luckiesh, M., Artificial Sunlight (A) 1189
Ludovici, A. M., Browne, F. W. S., and Roberts, H., Abortion, 1446
Lumbar sympathectomy, sterility and psychoneuroses following (A. F. Hurst) (C) 105
Lumsden, T., life without breathing (C) 456
Lung—cancer of, increase of (LA) 620 ; cancer of, sputum from (A) 1247 ; diseases of, radiography of, 1198, 1368 ; endoscopy
scopie et pleuroly
375 ; pulmonary
origin (A. G. Cro
osteo-arthropathy (A) 895 ; sepsis of (A) 674 ; silicosis, 1198, 1295 ; surgery of (Introduction à la chirurgie thoracique) (E. E. Lauwers) (R) 1184 ; *see also* Bronchi, Pneumonia, Respiration, Respiratory, and Tuberculosis, pulmonary
Lupus, *see* Skin
hormones
able ureter, 940
and some King's
Men (A) 80
Lymphadenoma, *see* Hodgkin's disease
Lymphatic system—elephantiasis (A) 1471 ; pulmonary emboli and (A. G. Cross) 1409 ; Tuberculosis of the Lymphatic System (R. H. Miller) (R) 1184
Lysis, transmissible bacterial, 1312

M

MacAlister, Sir Donald, of Tarbert (Lady MacAlister) (R) 1240
McAlpine, D., papillœdema caused by cervical cord tumour, 614
McArdle, B., whooping-cough (C) 454
McArthur, A., and Long, H. K., No Mean City : A Story of the Glasgow Slums (R) 1007
MacArthur, W. P., cysticercosis and epilepsy (C) 1430
McAusland, S., adhesive strapping and patch-test (C) 635
MacCallum, P., on calcification, 813
McCance, R. A., anoxæmia and renal function, 370
McCartney, J. E., intravenous solutions and blood transfusions, 1476
McCleary, G. F., on pre-school child, 40
McConnell, A. J. (O) 347
McCrae, T., death of, 34, (O) 107 ; Osler's Principles and Practice of Medicine (R) 1060
McCrea, E. D., undescended testis, 753, (LA) 1355
Macdonald, G., and Hargrave-Wilson, W., The Osteopathic Lesion (R) 670
McDonnell, J., A Doctor Talks (R) 308
McDougall, J. B., thrombo-angiitis obliterans, 366
McDowall, R. J. S., and Halliburton, W. D., Handbook of Physiology (R) 1184
McEwan, P., proctalgia fugax (C) 580
Macfarlane, R. G., on Russell's viper venom in hæmophilia (LA) 893
McGavin, D., thrombosis of pampiniform plexus, 368
McGibbon, J. E. G., perforation of œsophagus, 593
McGregor triennial prize award, 34
MacGuire, D. P., resection of sigmoid and sigmoid rectum, 1114
McKenzie, D. (O) 1267 ; memorial to, 1493
Mackenzie, M. D., on trachoma (LA) 434
McKeon, J. A., Weil's disease in coal-miners, 570
McKinlay, P. L., on blood pressure (LA) 1356 ; on maternal mortality and morbidity, 159
Maclean, Sir E., on puerperal sepsis, 1138
M'Lennan, Sir J. C., death of (A) 898
McLeod, J. W., on diphtheria, 250
McMichael, G. V. T., on Scottish health services, 739
Macmurchy, H., Sterilisation ? Birth Control ?, 751
Macnab, G. H., Henry and Jouvelet's pump, 1242
McNally, C. E., Public Ill Heath (R) 617
MacNalty, A., *Board of Education report*, 1440 ; Ministry of Health report, 913, (A) 897
Madelung's deformity (S. Barsoum) 428
Magill, I. H., on cyclopropane anæsthesia (A) 1362
Magnan, V., centenary of, 579
Maher, C. C., Electrocardiography (R) 376
Maller, R., cancer of œsophagus, 1052
Malaria—atebrin mussonate in, death following (P. B. Fernando and E. M. Wijerama) 1056, 1077 ; chemotherapy of, 631 ; congenital (N. C. Tanner and R. F. L. Hewlett) 369 ; control of (A) 382 ; in *British Colonies, 1200* ; in Ceylon, 1077, 1176 ; racial extinction and (A. J. Copeland) (C) 691
Malignant disease, *see* Cancer
Malkin, S. A., on after-effects of accidents, 1117
Malleson, J., Principles of Contraception, 1447
Malnutrition—Board of Education report, 1440 ; chorea and (G. F. Walker) 553 ; death-rate and (A) 1248 ; insulin in (LA) 561 ; maternal mortality and, 96 ; poverty and (PI) 221, 1382, 1489 ; Public Ill Health (C. E. McNally) (R) 617 ; *see also* Nutrition
Malocclusion of teeth, prognosis of (A. T. Pitts) (P) 567
Malpas, P., on carcinoma cervicis, 1161
of Manchester
. Human) (A) 677
infections (LA)
140, (M. L. Rosenheim) (C) 741
Manders, H. (O) 163
Manipulative surgeon, *see* Unregistered practitioners
Mansell, H. E., Benjamin Brodie, 108
Manson-Bahr, P. H., Manson's Tropical Diseases (R) 1353 ; on malaria in Ceylon, 1177 ; on yaws and syphilis, 135
Marett, R. R., Head, Heart, and Hands in Human Evolution (R) 720
Margate as health resort, 791
Markham, R. G., on food-poisoning at Nelson, 160
Marmorston, J., and Perla, D., Spleen and Resistance (R) 1300
Marquardt, M., Paul Ehrlich, 449
Marrack, J. R., vitamin-C subnutrition, 1399
Marriage—annulment of, impotence and, 1233 ; childless (A) 1246 ; of syphilitics (A) 624 ; Why Marry ? (S. Neville-Rolfe) (R) 1008 ; *Wife v. Husband in* the Courts (C. Mullins) (A) 622 ; *see also* Sex
Marriott, H. L., method of bleeding transfusion donors, 78, (C) 218
Marriott, W. M., Infant Nutrition (R) 1466
Marsh, F., toxæmia of burns (C) 1088
Marshall, C., Introduction to Human Anatomy (R) 1354
Marshall, C. J., chronic abdominal invalid, 908
Marshall, C. M., on breech presentations, 942
Marshall, F. N., diphtheria in Manchester, 441
Marshall, R., on Royal Victoria Hospital, Belfast, 970
Marshall, W. H., proctalgia fugax (C) 631
Martin, J. M., on nutrition, assessment of, 968
Martinez, J. A., cancer of liver, 1293
Masseuses—*Essentials of Light Treatment*, for use of Masseuses (E. M. Anderson) 1446
Mastitis, *see* Breast
Mastoiditis, silent (A) 314
Materia Medica, Pharmacy, Pharmacology, and Therapeutics (Sir W. Hale-White and A. H. Douthwaite) (R) 890
Maternal mortality—British Medical Association on, 210 ; debate on, 1254 ; deputation on, 231 ; in Ceylon (PI) 110 ; in Hebburn-on-Tyne (PI) 166 ; in Rhondda, 50 ; in Scotland, 159 ; nutrition and, 96 ; problem of (PI) 220 ; *see also* Childbirth, Midwifery, and Puerperal infection
Maternal Mortality Committee, conference, 43
Maternity and child welfare—(PI) 165, 913 ; clinic at Deptford, 1151 ; conference, 39, 152
Maternity hospitals, see Hospitals
Mather, J. H., perforation of œsophagus, 593
Matrimonial, *see* Marriage
Maxilla, *see* Antrum and Jaw
Maxted, W. R., on puerperal infection (LA) 1302
Maxwell, J., Weil's disease in sewer-worker, 998
Maycock, J. W., erythrocyte sedimentation-rate, 19
Maynard, E. P., on aortic syphilis (A) 839
Mayow, J., work of, 590
Meals—for unemployed juveniles (PI) 111 ; *see also* School-children
Measles—control of, in French town, 850 ; mortality from, influenza and (P. Stocks) 386, (D. Leys) (C) 581 ; prophylaxis, 210, 850, 1270, placental extract in (A) 728
Mecca, pilgrimage to (A) 1473
Meckel's diverticulum—intussusception *and (G. Duncan) 1174 ; peptic ulcer of*, 569
Medes, G., and Berglund, H., Kidney in Health and Disease (R) 23
Medical Annual, 1935 (H. L. Tidy and A. R. Short) (R) 558
Medical Annual General Index and Review, 1925–34 (R) 558
Medical Art Society (A) 32
Medical Charitable Society for the West Riding, 284
Medical Defence Union, jubilee (LA) 560
Medical Diary, 58, 111, 171, 232, 588, 642, 693, 752, 809, 866, 923, 986, 1037, 1097, 1150, 1211, 1271, 1331, 1392, 1498
Medical Directory (J. and A. Churchill) (C) 218, 272, (A) 259, 1309

Medical periodicals (A) 955 congres
Medical Register—(M. Hergotoci (C) [illegible] J. Wr 366 ; (C) [illegible] in cetes, pathogenic (A) 1014 ; Anæsths (J. Committee, 1378 ; appointments71 ; , 922 ; colour vision (A) 203 ; fe p ships, 349 ; iodine estimation (59 384 ; radium, 1083, (A) 1192 ; to vents, industrial, toxicity of, 263 ; Spa linger vaccine, 1330 ; vitamin A standardisation (A) 1307
Medical schools—opening of, 690, addresses at, 797, 854, (A) 896, 1043
Medicine—751, (W. Trotter) 783, (A) 896, 970, 1005, (Sir George Newman) 1043, (LA) 1468 ; Aims and Methods of Medical Science (J. A. Ryle) (LA) 1301 ; faith and (C. L. Leipoldt) 1494 ; Manual of Medicine (Sir S. Woodwark) (R) 721 ; Manual of the Practice of Medicine (A. A. Stevens) (R) 136 ; Medical Case-taking and Diagnosis (A. J. Kohiyar) (R) 137 ; Medicine in Persia (C. Elgood) (R) 26 ; Nobel prize for (A) 1016 ; physiology and (Sir H. Dale) 927, 1463 ; Practitioner's Library of Medicine and Surgery : Vol. VIII. Therapeutics (G. Blumer, D. P. Smith, and A. J. Sullivan) (R) 771 ; Principles and Practice of Medicine (Sir W. Osler and T. McCrae) (R) 1060 ; Year Book of General Medicine (A) 1472 ; *see also* Preventive medicine
Medicines, *see* Drugs

MEDICINE AND THE LAW (*see also* Forensic).—Abortion, criminal, naturopath and, 1438—Arm inquest, 40, 687—Battersea General Hospital, 1257—Coroner, obstruction of, 214—Death certificate, error in, 446—Diabetes, unqualified practitioner and, 630—Drowning, death by, 446—Drunk, not in charge of car, 445—Evidence : hearsay, 339 ; medical, 267, 1481—Films as criminal records, 1082—Fingerprints, 576—Floors, slippery, [illegible] Food poisoning, [illegible] mann's appeal, [illegible] 687, 1437—Infectious disease, omission to notify, 395—Life, shortened, damages [illegible] Petrol and explosives, 41—Practitioner as company director, 1481—Practitioner's right to his own name, 1201—Prehistoric man, inquest on, 631—Psychiatry in schools of law, 969—Puerperal melancholia, 631—"Punch-drunk," 1082—Road traffic courts, 969—Suicide by starvation, alleged attempt, 395—Tetanus, post-operative, 577—Vegetarian diet, lodging-house keeper and, 1318—Venereal Diseases Act, prosecution under, 1146, 1317

Melæna, treatment of, with food (E. Meulengracht) 1220, (J. J. Spira) (C) 1378, (J. B. Hunter) (C) 1431
Melanotic sarcoma—melanin-bearing cells in ascitic fluid (W. R. Snodgrass) 668 ; prognosis of (E. S. Horgan) (C) 156
Mellanby, E., on cancer (A) 1250 ; on nerve lesions and vitamin-A deficiency (A) 313
Melly, J. M., ambulance service for Ethiopia, 632, (A) 896 ; infibulation, 1272
Memoirs of a Camp Follower (P. Gosse) (R) 1008
Memory, loss of, *see* Amnesia
[illegible] 36 [illegible] E. H. Simpson) [illegible] (D. Leys) 190 ; [illegible] Harrower) 715, (A. Piney) (C) 802 ; tuberculous (LA) 950 ; *see also* Cerebro-spinal fever
Menopause—hormone therapy and, 794 ; Women over Forty (S. Trent) 172
Men[illegible] of (E. M. R. [illegible] therapy and, [illegible] 1, 1296
M[illegible] of Control's [illegible] phenylpyruvic [illegible] 192 ; special schools or special classes for, 101 ; Subnormal Mind (C. Burt) (R) 617
Mental disorder—amnesia (A) 953 ; anonymous letter writers and (A) 1015 ; boarding-out of patients, 340 ; Board of Control's report, 685 ; Chronic Nasal Sinusitis and its Relation to Mental Disorder (F. A. Pickworth) (R) 669, (C) 1090, (T. C. Graves) (C) 1484 ; crime and (ML) 267, 631, 969, 1082, (A) 563, 565 ; Criminal Lunatics (Scotland) Bill (PI) 226 ; dementia præcox, pyrotherapy in (D. Menzies) 994 ; early, treatment of, 450 ; endocrinology and, 93 ; hæmatology and, 93 ; in adolescence, 905 ; Magnan, V., work of, 579 ; Mentality and the Criminal Law (O. C. M. Davis and F. A. Wilshire) (R) 1353 ; obsessional illness (A) 1420 ; physiological mechanism of, 335 ; Pinsent-Darwin studentship, 1329 ; *see also* Nervous disorder, Psychiatry, and Psychology
Mental hospitals—Doors of Hope (M. Hankin) 591 ; Maudsley Hospital, research donation to (LA) 952, 981 ; mental welfare centre, 464 ; Retreat, York, 61 ; scabies outbreak (F. E. Kingston) 815, (R. Eager) (C) 917 ; Staffordshire, 994 ; Sunderland Corporation Mental Hospital, 847
Mental hygiene—conference on, 693 ; European reunion of, 340 ; international congress of, 43 ; in United States, 1081 ; social aims of, 965
Menzies, D., pyrotherapy in dementia præcox, 994
Mercurial—poisoning, nephritis and (A) 260 ; preparations, germicidal properties of (A) 838, (W. C. Reynolds and S. N. H. Stothart) (C) 917, (J. G. Baumgartner and M. D. Wallace) (C) 1031
Metabolism—of water and fat, liver function and (H. Selye, J. B. Collip, and D. L. Thomson) 297 ; *see also* Obesity
Métivier, V. M., atropine poisoning, 1232
Metropolitan Water Board, appointment, 57
Meulengracht, E., treatment of hæmatemesis and melæna with food, 1220
Meyer, E., Pflanzliche Therapie (R) 308
Mialeret, J., and Basset, A., L'épaule (R) 26
Michel, G., on problems of surgery, 917
Micks, L. H., Essentials of Materia Medica, Pharmacology, and Therapeutics (R) 429
Middlesex Hospital Medical School—57, 283 ; post-graduate lecture, 793 ; refresher course, 641 ; Story of Middlesex Hospital Medical School (H. C. Thomson) (R) 251
Middleton, E. L., on industrialism and tuberculosis, 1295
Midwifery—gas-and-air apparatus for (J. Elam) 1253 ; general practice and, 210 ; independent midwife (LA) 1009, (T. W. Eden) (C) 1088, (E. M. Pye) (C) 1088, (Dame J. Campbell) (C) 1145 ; Practical Handbook of Midwifery and Gynæcology (W. F. T. Haultain and C. Kennedy) (R) 1466 ; service of midwives, 210, 219, (G. B. Carter) (C) 277, (J. Elam) (C) 344, (LA) 1009, 1254, 1374, (H. Waller) (C) 1430 ; *see also* Childbirth and Obstetrics
Midwives Institute—Fynes-Clinton lecture (LA) 1009, 1088, 1145
Migraine, *see* Headaches
Mijnlieff, C. J., manual artificial respiration, 149, (LA) 139, (C) 741
Milk—Attested Herds Scheme (PI) 345 ; Bacteria in Relation to the Milk Supply (C. H. Chalmers) (R) 831 ; consumption of, 342 ; designations (LA) 29 ; for hospitals (PI) 54, 347 ; germicide process and (PI) 165 ; Government's pure milk policy (PI) 1488 ; Lactobacillus Acidophilus (L. F. Rettger, M. N. Levy, L. Weinstein, and J. E. Weiss) (R) 721 ; milk bottles, hygienic caps for, 696 ; new Milk Order (PI) 1384 ; processing and control, instruction in (A) 200 ; tuberculosis and, 37, (LA) 29 ; *see also* Bovine tuberculosis and School-children
Milk, human—pooled (A) 314, (R. Lightwood) (C) 405 ; restoration of (W. B. Crawford) (C) 1208
Milk sugar, origin of (A) 1248
Millar, T. G., on ultra-violet light therapy in laryngeal tuberculosis, 1026
Millard, C. K., on vaccination, 1099 ; on voluntary euthanasia, 1386 ; presentation, 349
Miller, A., modified Siegel's speculum (NI) 81 ; nasal ionisation, apparatus for (NI) 194 ; peritonsillar abscess opener (NI) 1123
Miller, A. A. (O) 348
Miller, C. J., Introduction to Gynæcology (R) 252
Miller, E., Insomnia and other Disturbances of Sleep (R) 137
Miller, E. C. L., and Dorland, W. A. N., Dorland's Medical Dictionary (R) 670
Miller, R., chronic duodenal ileus, 115 ; difficult children, 1393, 1410 ; slimming problems in children and adolescents, 793
Miller, R. H., Tuberculosis of the Lymphatic System (R) 1184
Miller, S., protein shock for undulant fever (C) 1030
Mills-Roberts, R. H. (O) 1320
Milroy lectures, 173, 233
Mind—structure of, 829, (A) 837 ; *see also* Intelligence
Mindline, J., duodenocolic fistula, 764
Mineral oils, cracked, carcinogenesis by (C. C. Twort and J. M. Twort) 1226
Miners—barytes, lung trouble in (PI) 54 ; health and safety of (PI) 279, 1488 ; Miner's Welfare Fund (A) 435 ; nystagmus, workmen's compensation and (PI) 53, 347, 1032, 265 ; silicosis in, 1198, 1295 ; Weil's disease in (H. A. Cookson) 192, (W. G. A. Swan and J. A. McKeon) 570 ; welfare work and (PI) 281
Ministry of Agriculture—furunculosis in fish (A) 1066
Ministry of Health—aluminium in food (A) 954 ; annual report, 584 ; appointments, 262, 1037 ; chief medical officer's report, 913, (A) 897 ; food-poisoning (A) 89 ; maternal mortality, deputation on, 231 ; Minister of Health's review (PI) 220 ; pneumonia, 914 ; secret remedies, advertisement of, 97, (LA) 83
Minot, G. R., reticulocyte reactions, 319, (LA) 312
Mistal, O. M., Endoscopie et pleurolyse (R) 375
Mitchell, C. A., on forensic chemist (A) 1013
Mitchiner, P. H., Modern Treatment of Burns and Scalds (R) 1354
Mitman, M., on diphtherial paralysis, 81
Moberly, Sir W., purpose of university training, 855
Moir, C., on ergometrine, 1260
Moles and melanotic sarcoma, prognosis of (E. S. Horgan) (C) 156
Moloney test, diphtheria formol toxoid and (R. Swyer) 22
Moncrieff, A., on convalescent homes for children, 40 ; Text-book on Nursing and Diseases of Sick Children (R) 252
Monier-Williams, G. W., on aluminium in food (A) 954
Monocytic leukæmia (T. N. Gledhill) 824
Monod, R.-C., Leveuf, J., and Girode, C., Traitement des fractures et luxations des membres (R) 1060
Montague, J. F., Modern Treatment of Hæmorrhoids (R) 196
Moodie, W., on difficult children, 1410
Morbus Gallicus (L. Baumgartner and J. F. Fulton) (R) 1126
Morgan, D. G., doctor as administrator (C) 634
Morison lectures, 41, (LA) 1185
Morland, A., pneumothorax needle (NI) 253
Morphine—addiction (A) 624 ; poisoning, proprietary remedy and (A. Renshaw) 132
Morrison, G. H., death of, 538, (O) 586
Morrow, C. A., Biochemical Laboratory Methods (R) 430
Morson, A. C., on prostatectomy, 903
Mortality, *see* Death, Infant mortality, and Vital statistics
Mortensen, H., on urinary antiseptics, 1076
Mortgaging of practices (PI) 54, (PCP) 1372
Morton, J. L., forceps operation (C) 801
Morton, R. A., Application of Absorption Spectra to the Study of Vitamins and Hormones (A) 897
Motorists—drunk, not in charge of car (ML) 446 ; drunkenness, medical evidence and (A) 31, (ML) 576 ; *see also* Road accidents
Moutier, F., Traité de gastroscopie (R) 82
Moynihan, J. H., war mentality (C) 1031
Moynihan, Lord, on voluntary euthanasia, 1385
Mucous and Salivary Gland Tumours (H. E. Ahlbom) (R) 1415
Mullins, C., Wife v. Husband in the Courts (A) 622
Mummery, N. H., Association of Industrial Medical Officers (C) 1031
Münchmeyer's disease, 1239
[illegible] oteins and [illegible] 36 [illegible] disorder

Murphy, G., Briefer General Psychology (R) 1299
Muscle tonus, depression of (Y. Henderson) 178
Myasthenia gravis, potassium chloride in (M. B. Walker) (C) 47
Mycological infections, 1074
[illegible] Heart disease
[illegible] conscious and, [illegible] 48

N

[illegible] (C) 860

National Birth Control Association (M. A. Pyke) (C) 1268
National Council for Mental Hygiene, 693
National Institute for the Deaf (A) 728
National Institute of Industrial Psychology, 22
National Insurance Defence Trust (PCP) 1373, 1482
National Ophthalmic Treatment Board, 209
National Physical Laboratory—explosions in operating theatres, 1327
National Radium Commission, 808
National Special Schools Union, 101
Naturopaths, *see* Unregistered practitioners
Naval Medical Compassionate Fund, 170
Neale, A. V., leptospiral infection from stream, 999
Neave, F. K., on test for pasteurised milk (LA) 29, (A) 200
Negligence, slippery floors, damages for (ML) 214
Negus, V. E., prognosis in foreign bodies in air and upper food passages (P) 730
Neil, W. F., hæmatemesis, surgery and (C) 973
Neokharsivan, aplastic anæmia following (A. H. Imrie) 73
Neonatal, *see* Infants
Nephritis—azotæmia and (J. B. Rennie) 658 ; [illegible] hypertrophy [illegible] ache and (Si [illegible] y in Health [illegible] and G. Medes) (R) 23 ; mercurial poisoning and (A) 260 ; multiple myeloma and (A) 836 ; *see also* Kidney and Urinary infections
Nervous disorder—chorea and (G. F. Walker) 553 ; chronic abdominal invalid (C. J. Marshall) 908 ; headaches and (Sir E. Spriggs) 1, 63, (C) 344, (J. Geoghegan) (C) 158 ; impotence, 1233 ; lumbar sympathectomy and (A. F. Hurst) (C) 105 ; Nervous Patient (C. P. Emerson) (R) 831 ; pruritus and, 287 ; raw eggs for (I. Singh) (C) 636 ; skin disorders and (LA) 1063 ; unemployment and (A. Lewis) 293, (LA) 311, (H. A. Palmer) (C) 455 ; war and (LA) 311 ; *see also* [illegible]
[illegible] *autonomic*, central representation of, 333, 334 ; Autonomic Nervous System (J. C. White) (R) 1182 ; chemistry of, 446, (Sir W. Langdon-Brown) 911, 1155, (Sir H. Dale) 927, (LA) 1011 ; decalcification and (A) 1421 ; Diseases of the Nervous System (S. E. Jelliffe and W. A. White) (R) 1183 ; erythromelalgia (H. S. Carter) 327 ; neurotropic virus diseases (E. W. Hurst) 697, 758 ; organic whole and, 945 ; Pacemakers in Relation to Aspects of Animal Behaviour (H. Hoagland) (R) 772 ; pain and (H. A. Dunlop) 909, (Sir W. Langdon-Brown) 911 ; pathology of (Nouveau traité de médecine : Pathologie du Système Nerveux) (R) 1184 ; shivering and (A) 381 ; sympathetic paralysis for arterial obstruction (G. Williams) 1020 ; visceral sensibility and (S. Wright) 794 ; vitamin A and (A) 313 ; *see also* Brain, Spinal, [illegible]
[illegible] Association—committee for war prophylaxis, 265, 907, 1031
Neumann, A., Die Krebsbehandlung der täglichen Praxis (R) 196
Neurasthenia, *see* Nervous disorder
Neuritis, *see* Nervous system
Neurology—congress of (A) 204, 268, 33[illegible] 737 762, Pavlov's visit to (A) 258 ; research on, 747, donations for (LA) 952 ; Textbook of Clinical Neurology (I. S. Wechsler) (R) 1300 ; Year Book of Neurology, Psychiatry, and Endocrinology (H. H. Reese, H. A. Paskind, and E. L. Sevringhaus) (R) 1241
Neuroses, *see* Nervous disorder
Neurotropic virus diseases (E. W. Hurst) 697, 758
Neville-Rolfe, S., Why Marry ? (R) 1008

NEW INVENTIONS.—Abdominal drainage, forceps for (A. K. Henry) 1414—Drain introducer (T. J. D. Lane) 254—Endotracheal insufflation of the newborn, apparatus for (G. F. Gibberd and J. B. Blaikley) 138—Fripp-McConnell bed-clothes support and exerciser (A. T. Fripp) 191—Henry and Jouvelet's pump (E. S. Lee and G. H. Macnab) 1242—Laryngoscope, detachable (J. Elam) 616—Nasal ionisation, [illegible] er) 194—Peri- [illegible] A. Miller) 1123 [illegible] (A. Morland) 235—Siegel's speculum, modified (A. Miller) 81—Speculum, vaginal, self-retaining (C. H. Rivers) 305—Stomach-holding forceps (T. J. D. Lane) 253—Tonsil dissector (E. Gwynne-Evans) 556—Urethral dilating bougie and catheter (M. Paul) 556

Newman, Sir G., new purpose of medicine, 1043

Ni [illegible] (Coates [illegible] (Ephe- [illegible] 1273— [illegible] s) 353, [illegible] Hypo- [illegible] (Burroughs Wellcome and Co.) 1273— [illegible]) 464 [illegible] Pure [illegible] on" Chocolate [illegible] Mono- trean (A [illegible]) 926 —Ostoc [illegible] bora- tories) [illegible] and Cooper [illegible] with Casca [illegible] —Phc [illegible] Drug [illegible] La R [illegible] and Co.) 410—Theotone (Allen and Hanburys) 410—Veganin Brand Tablets (Wm. R. Warner and Co.) 464

Nichol, R. W., evipan sodium with premedication (C) 861
Nicholas, F. G., eventration of diaphragm, 611
Nicol, W. D., on general paralysis of insane, 94
Nigerian natives, Hodgkin's disease in (E. C. Smith) 874, (A) 895
Nitch, C. A. R., prognosis in papilloma of bladder (P) 781
Nitrous fumes, poisoning by (A) 623, (PI) 1033
Nitti, F., La vaccinothérapie dans l'asthme bronchique (R) 720
Nobel prize for medicine (A) 1016
Noble, R. A., teaching of medical psychology (C) 1327
Nodules, subcutaneous, rheumatic (G. Davison) 1057
No Mean City : A Story of the Glasgow Slums (A. McArthur and H. K. Long) (R) 1007
Non-protein nitrogen, *see Azotæmia*
Norman, H. J., on psychiatric digressions, 827
Norris, C. T., drug habit (C) 743
North, H. M., on sleep (LA) 1188
Nose—airway of, measurement of (Sir L. Hill) 70 ; ant-sting in (J. Wiltshire) (C) 344 ; ciliary action (A) 1066 ; clinics, American (M. Ellis) 643 ; foreign bodies in (V. E. Negus) (P) 730 ; ionisation of, apparatus for (A. Miller) (NI) 194 ; vasomotor rhinorrhœa (A. Tumarkin) 826 ; *see also* Sinuses
Nosworthy, M. D., Theory and Practice of Anæsthesia (R) 618
Novarsenobenzene in anthrax (F. W. Gilbert) 1283
Nullity, *see* Marriage
Nurses—films for, 922 ; Irish, pension scheme for, 1204 ; psychology lectures for, 866
[illegible] pas, P., [illegible] otomy cases, 114 ; district,
[illegible] chester- 1041 ; in London County
[illegible] ir E. D. [illegible] spitals, 275 ; Text-book on
[illegible] delic acid Diseases of Sick Children
[illegible] 0, (M. [illegible] ieff) (R) 252
[illegible] lers, Jr, A. M., eventration of diaphragm, 611
[illegible] etit—advisory committee on (PI)
[illegible] ell-84 ; assessment of (LA) 197,
[illegible] A) 951 ; British Medical Association [illegible] nutrition committee, 207, (A) 562 ; centres for, 276 ; Expert Commission on Nutrition, 1270, (A) 1305, 1423, 1434 ; *Nutrition and Physical Fitness* (L. J. Bogert) (R) 430 ; Stark, W., work of (J. C. Drummond and A. Wilbraham) 459 ; world survey of, 341, 1270 ; *see also* Diet, Malnutrition, and Vitamins
Nystagmus, *see* Miners

O

Oakley, W., alkalosis in treatment of peptic ulcer, 187
Oberner, E., Health, and a Changing Civilisation (R) 137
Obesity—ætiology and treatment of (J. H. Anderson) 604, 846, 1237, (H. W. Hales) (C) 1328 ; *Diabetes Mellitus and Obesity (G. G. Duncan)* (R) 306 ; pituitary and, 1310 ; slimming problems in children and adolescents (R. Miller) 793 ; *see also* Dinitrophenol

OBITUARY

Acton, H. W., 586—Amrein, O., 403—Anderson, J., 453—Askins, R. A., 1439
Braithwaite, N., 50—Bryce, G., 859—Burn, G. W., 1209—Butterfield, F., 1423
Campbell, H. J., 107—Chambers, H., 228—Chill, E. A., 347—Crawley, F. C., 1487
Day, J. M., 49—Dudley, H. W. (A) 839—Duncan, W., 746—Dutton, T., 1147—Dwyer, Sir F. C., 919
Eardley-Wilmot, R., 1381—Elliott, J. T., 746—Erdmann, R. (A) 625—Evans, G., 1381
Fernando, Sir H. M., 1487—Frost, W. A., 1096—Fuller, A., 587
Gellatly, J. H., 229—Gibson, J. M., 1147—Grant, A. C., 1267—Grant, C. G., 228
Humphreys, W. C., 859—Hunter, J. (A) 204
Jones, W. H., 278
Le Riche, P. J., 403—Little, E. M., 858
McConnell, A. J., 347—McCrae, T., 107—McKenzie, D., 1267—M'Lennan, Sir J. C. (A) 898—Manders, H., 163—Ménétrier, P., 736—Miller, A. A., 348—Mills-Roberts, R. H., 1320—Morrison, G. H., 586
Nash, W. G., 401—Nesbitt, R., 1440
O'Brien, C. M., 395—O'Dea, S., 587
Paul, G., 1085—Peachey, G. C., 108—Pepper, A. J., 1486—Perrin, W. S., 1439—Picken, S. E., 278—Plows, W. H. (A) 729—Porter, Sir J., 400—Pringle, H., 1381
[illegible] A) 318— [illegible] W. G., [illegible] -Riddell, [illegible] 1381—Rumboll, C. F., 1036
Samuel, D., 163—Shaw, F., 1487—Shillitoe, A., 402—Shrubsall, F. C., 894—Sinclair, A. M. R., 1381—Spicer, W. T. H., 400—Spurrier, A. H., 163—Stacey-Cleminson, F., 107—Suckling, C. W., 279—Suttie, I. D., 1035
Tattersall, C. H., 1208
Walker, H., 453—White, E. W., 1320—Winter, W. A., 1096
Young, G., 1147
Zammit, Sir T., 1096

O'Brien, C. M., death of, 395
O'Brien, R. A., on diphtheria prophylactics, 250
Obstetrics—breech presentations, 941 ; Cæsarean section, 788, prognosis of

(E. Holland) (P) 1135; congress of, 641; ergometrine and ergotocin in, 1259; forceps operation (A. J. Wrigley) 702, (LA) 725, (D. Baird) (C) 801, (J. L. Morton) (C) 801; in Dublin (A) 563; inversion of uterus (J. Cook) 884, (C. J. C. Cooke) (C) 971; of the future (M. H. Phillips) 1107; placenta prævia, 789, (F. J. Browne) 959, 1135; *see also* Childbirth, Maternal mortality, and Midwifery
O'Dea, S. (O) 587
O'Donovan, P. H., bleeding of transfusion donors (C) 345
Œdema, *see* Dropsy
Œsophagus—cancer of (R. Mailer) 1052; corrosive burns of (A) 1419; direct inspection of (N. Patterson) 1019; foreign bodies in (V. E. Negus) (P) 730, perforation by (J. E. G. McGibbon and J. H. Mather) 593, (N. Asherson) (C) 691; surgery of (Chirurgie de l'œsophage) (R. Grégoire) (R) 832
Œstrin, *see* Sex hormones
Office International d'Hygiène publique—plague in Africa, 1478
O'Flaherty, P. E., death of, 970
Okell, C. C., bacteriæmia and oral sepsis, 869
Old age—appendicitis in (H. Taylor) 937; Care of the Aged, the Dying, and the Dead (A. Worcester) (R) 430; How to Live for a Hundred Years and Avoid Disease (L. Cornaro) 646; intellectual capacities and (LA) 1356; personality and (LA) 672
Olive oil in carbolic acid poisoning (A) 623
Oliver, Sir T., exophthalmos, 1116
Oliver, W. (Bath), memorial to, 926
Omentum, fat necrosis of, duodenal ulcer and (M. J. Smyth) 15
Onchocerciasis in England (H. A. Osborn) 1000
Onion, smell of, in breath (A) 316
Operations, *see* Anæsthesia and Surgery
Ophthalmology—All-India Ophthalmological Society, 227; Oxford Ophthalmological Congress, 100
Optic atrophy, hereditary (A) 1249
Opticians, sight testing by, 209
Oral—cancer, radium in, 1083; *see also* Teeth
Orchidectomy, *see* Testis
Order of St. John of Jerusalem, appointments and promotions, 57
O'Reilly, J. J., perforation of stercoraceous ulcer, 1175
Orion, launching of, 463
Orthopædics—development of, 770; *see also* Fractures and Injuries
Osborn, H. A., onchocerciasis in England, 1000
Osborne, W. A., on vasoconstrictor principle in skin of frog, 1076
Os calcis, fractures of, 1256
Osler, Sir W., and McCrae, T., Principles and Practice of Medicine (R) 1060
Ossification — Münchmeyer's disease, 1239; *see also* Bone
Osteopathy—manipulative surgeon, use of description (ML) 1023, 1202, (LA) 1128; Osteopathic Lesion (G. Macdonald and W. Hargrave-Wilson) (R) 670; Osteopaths Bill, 213, (LA) 197, 210
Otitis—chronic suppurative, 1025, in school-children (LA) 724; prognosis in (W. Howarth) (P) 1071
Ovaries—ovariotomy, 1463; undescended (R. M. Walker) 1346
Ovum, *see* Fœtal
Owens, J. S., ultra-violet radiation, 589
Oxford Ophthalmological Congress, 100
Oxygen, *see* Anoxæmia and Inhalation therapy

P

Pacemakers in Relation to Aspects of Animal Behaviour (H. Hoagland) (R) 772
Pacific, racial pressure problems in, 900
Page, A. P. M., undulant fever treated by protein shock, 940
Page, C. M., on orthopædic surgery, 770
Pain—as neurological symptom (H. A. Dunlop) 909; fear and (Sir W. Langdon-Brown) 911; visceral (S. Wright) 794; *see also* Euthanasia
Palate, cleft (W. E. M. Wardill) (C) 47, (D. Levi) (C) 105
Palmer, G. T., on assessment of nutrition (LA) 951
Palmer, H. A., neurosis and unemployment (C) 455
Pampiniform plexus, thrombosis of (D. McGavin) 368
Pancreas—acute inflammation of (R. H Dobbs) 989, (LA) 1063; surgery of, 845

Panel and Contract Practice (*see also* Insurance, National Health).—Alternative occupation, fitness for, 1371—Assistants, employment of, 456, 803—Baths, medical, provision of, 274—British Columbia, health insurance scheme for, 161—Capitation fee, 1373—Certificates: final, patient's temporary work and, 163; issued without examination, 738; use of, employers and, 1321—Chemists, number of, 638—Choice of doctor, employers and, 1321—Complaints against practitioners, 398, 578, 920, 1034, 1086, 1206—Confinement, incapacity after, 1321—Consultation hours, 1143—Dangerous drugs, 920—Dental letters, 1482—Diphtheria immunisation, 1373—Dispensing hours, 275—Drugs and appliances, 1482—Gin, prescription of, 1087—Group practice in America, 1086—Housing schemes and surgeries, 162—London Insurance Committee, 1034—London insurance statistics, 162—Manual labour, definition of, 638—Medical benefit, extension of, 577, 1483—Medical benefit regulations, revised clause in, 577—Medical list, inclusion in, 1087—Medical records, 740, 968, 1372—Mortgaging of practices, 1372—National Health Insurance and Contributory Pensions Act, 397, 1321—National Insurance Defence Trust, 1373, 1482—Panel conference, 1371, 1482—Practitioners: disability, 48, 803; number of, 638—Prescribing costs, 274, 639, 689, 967, 1143—Profession, medical, criticism of, 48—Regional medical service, 638, 967—Remunerations, deductions from, 274—Representation on Insurance Acts Committee, 1371—Road accidents, 1372—Service subcommittee's recommendations, 274—Specialist treatment, charge for, 457—Spinal jackets, 1143—Surgical spirit, 689—Transference of patients, 738, 1483—Tuberculosis in Wales, 689—Tuberculosis notification, 803—Vaccines, cost of, 967—Vaginal operation, assistance at, 397—"Whitewashing" of colleagues, 49

Pannett, C. A., resection of rectum, 423
Panting, C. H., on public medical services, 1480
Papillœdema, cervical cord tumour and (D. McAlpine) 614
Papilloma of bladder, prognosis in (C. A. R. Nitch) (P) 781
Parachute—descents, free falls and (A) 1013; first aid by, 425
Paramore, R. H., anuria treated with spinal anæsthesia, 554
Parasitology—Clinical Parasitology and Tropical Medicine (D. de Rivas and C. T. de Rivas) (R) 1466; Guide to Human Parasitology (D. B. Blacklock and T. Southwell) (R) 1416
Paratyphoid fever, *see* Enteric fever

Paris, Correspondence from.—Advances in medicine, application of, 850—Anthrax, 850—Assises de Médecine, 1261—Bread, quality of, 1084—Dentists, census of, 849—Diet of Parisian, 43—Enteric fever, 336, 1369—Guéniot, A., death of, 337—Histidine in peptic ulcer, 579—Laboratory assistants, unskilled, 688—Magnan, V., centenary of, 579—Measles, control of, 850—Medical certificates, fraudulent, 849—Medical journals, 1084—Ménétrier, P., death of, 736—Mental hygiene, international congress of, 43—Practitioners: census of, 849; economy and, 579, 1084; foreign, 42—Rabies, decentralised vaccination and, 579—Road accidents, 337—Sanatorium for French students, 688—Surgical congress, 917—Tetanus immunisation, 687—Tuberculosis, 337, 735, 1369—Undulant fever, 1369

Park, C. L., on incidence of disease in Eastern countries, 902
Park, W. H., medal, 219; on poliomyelitis (A) 1131
Parkes, A. S., on new source of hormones (A) 1189
Parliament, *see* General Elections and—

PARLIAMENTARY INTELLIGENCE

  Accidents: in building trade, 55; in factories, 1384, industrial diseases and, 223—*Africa, natives of*, backwardness in, 166—Air raids, precautions against, 226, 281, 346, 347, 1442—Alcohol: drunkenness statistics, 1033; motorists and, 346—Anæsthesia: in animal experiments, 1490; in midwifery, 1442—Army, suicides in, 1384—Atmospheric pollution, smokeless fuel and, 166
  Barbers' implements, sterilisation of, 1383—Board of Control, Scottish: salaries of medical officers, 227
  Children: Children's Branch, work of, 281; employment of, in agriculture, 54; gas mask drill and, 281; necessitous, footwear for, 1488; unemployment benefit and, 979, 1032
  Deaf, care of, 54
  [illegible] to, 55 [illegible] lth of [illegible] post- [illegible] r: in Essex, 347; in Palestine, 1489
  Foods, composition and description of, 1488
  Herbalists, 166—Herrings, food value of, 281—Hertfordshire County Council Bill, 51—Hospitals: electric lighting failures and, 226; in special areas, 1442; London County Council, puerperal fever serum in, 111; Lotteries Act and, 165; military hospital at Edinburgh, 281; milk for, 54, 347; patients and polling facilities, 1489; pensioners in, 979, 1032, 1033, 1488; telephone charges and, 1488; Voluntary Hospitals (Paying Patients) Bill, 53, 1441—Housing: balconies for working-class flats, 164; dilapidated dwellings, repair of, 1442; Housing (Scotland) Bill, 53, 108, 164; in Scotland, 52; overcrowding, 108, 1383, 1384, 1489
  Infant mortality, 166, 220—Insulin, free, for diabetics, 1384—Insurance, National Health: appeal, 54; cards for, 1384; mortgage of practices, 54; National Health Insurance Act, 109, 164, 1032; pensioners and, 1033; provision of milk, 1383; voluntary contributions and, 1383
  King's Speech, 1330, debate on, 1382, 1441
  Local authorities: specialist medical treatment and, 51; superannuation schemes and, 110—Locusts and malarial mosquitoes, destruction of, 110
  Malnutrition: committee on nutrition, 165; in Lancashire, 1489; poverty and, 221, 1382—Maternal mortality: in Ceylon, 110; in Hebburn-on-Tyne, 166; problem of, 220—Maternity and child welfare, 165—Medicines, patent, advertisement of, 166—Mental deficiency, lunacy and, 166—Mental disorder: Criminal Lunatics (Scotland) Bill, 226—Milk: Attested Herds Scheme, 345; for hospitals, 54, 347; for school-children, 110, 165, 227, 1383, 1489; germicide process and, 165; Government's pure milk policy, 1488; new Milk Order, 1384—Miners: barytes, lung trouble in, 54; health and safety of, 279; mines inspectors at inquests, 281; nystagmus, workmen's compensation and, 53, 347, 1032; Royal Commission, 1488; welfare work and, 281—Motorists: alcohol and, 346; driving tests, 1383
  National maternity service, 1489—National parks, 1384—Nursing-homes, traffic noise and, 346
  Paint spraying, infection of workers and, 55—Palestine: enteric fever in, 1489; medical licences in, 1441—Pensioners, 227, 280, 979, 1032, 1033, 1488—Pharmacy and Poisons Act, 226, 281, 1489—Prisons: administration in Scotland, 108, 167; governor of Holloway Prison, [illegible] and, 1383—Public health: in Aden Protectorate, 164; in Cardiff, coloured population and, 166; in Colonies, 280; in Scotland, 52;

Minister of Health's review, 220; services, 1330, 1382, 1441—Public service, sickness in, 281
Reassembly, 979—Research, state grants for, 110—Royal Air Force recruits, medical rejections of, 1442
School-children: meals and milk for, 110, 165, 227, 1383, 1489; physical training for, 54, 1489—Schools: black-listed, 1489; infectious diseases in, old books and, 1442—Scotland: health servi[illegible]
prisons, 108, [illegible]
ton scheme, [illegible]
bovine vacci[illegible]
eugenic, 1490
Unemployment: children's benefit, 979, 1032, public assistance and, 1383; health insurance and, 109, 164, 1032; provision of meals and milk, 110, 111, 165, 227, 1383, 1489; regulations, 979, 1383—*University of Durham Bill*, 53, 345
Vaccination, compulsory, 166—Ventilation of House of Lords, 279
Water-supplies, rural, 280, 1442—Women and young persons, employment of, 1383—Workmen's compensation: inquiry, 53, 347, 1032; supply of surgical appliances, 166—Wyton Sanatorium, future of, 227

Paroxysmal tachycardia, acetylcholine in (A. B. Stenhouse) 1291
Parsons, L. G., on ascorbic acid (LA) 432
Paskind, H. A., Reese, H. H., and Sevringhaus, E. L., Year Book of Neurology, Psychiatry and Endocrinology (R) 1241
Passey, R. D., on cancer of lung (LA) 620
P[illegible] (A) 676
P[illegible] and control, instruction in (A) 200; test for (LA) 29, (A) 200; value of, 38, (LA) 29
Patch test, *see* Allergy
Patella, dislocation of (F. Forty) 1046
Paterson, D., control of whooping-cough, 361, (LA) 377, (C) 1207; vaccination on the third day (C) 691; and Smith, J. F., Modern Methods of Feeding in Infancy and Childhood (R) 832
Pathology—of osseous tissue, 844; of spinal caries (H. J. Seddon) 355
Patients—chronic, problem of, 887, (A) 897; Doctor and the Public (J. P. Warbasse) (R) 722; Nervous Patient (C. P. Emerson) (R) 831; Patient and Doctor (Sir H. B. Brackenbury) (R) 722, (A) 729, (LA) 833
Patterson, N., direct inspection of larynx, lower pharynx, lower air-passages, and gullet, 1019
Paul, G., death of, 1085
Paul, M., combined urethral dilating bougie and catheter (NI) 556
Paulian, D., Tumeurs de l'encéphale (R) 1183
Pavlov, I. P., on types of higher nervous activity, 335; visit of (A) 258; work of, 447
Peachey, G. C. (O) 108
Pearl, R., on biology and human trends, 751
Pearson, S. V., Growth and Distribution of Population (R) 307
Pearson, W. J., and Wyllie, W. G., Recent Advances in Diseases of Children (R) 720
Pellagra—1239; kwashiorkor and (C. D. Williams) 1151, (H. S. Stannus) (C) 1207
Pemberton, R., Arthritis and Rheumatoid Conditions (R) 1465
Penrose, L. S., inheritance of phenylpyruvic amentia, 192
Pensioners—claims to pensions (PI) 227, 280; health insurance and (PI) 1033; hospital treatment and (PI) 979, 1032, 1033, 1488
Pentnucleotide—in aplastic anæmia (J. M. Holmes) 71; *see also* Agranulocytosis
People's League of Health—maternal mortality, nutrition and, 96
Pepper, A. J. (O) 1486
Peptic ulcer—alkalosis in treatment of (W. Oakley) 187, (G. Evans) (C) 582, (D. Hubble) (C) 634; duodenal, fat necrosis and (M. J. Smyth) 15; gastroscopy in (H. C. Edwards) 1161, (LA) 1244; histidine in, 579; in Solomon Island native (C. James) 304; jejunal (R. P. P. Davies) (P) 678, gastrocolic fistula and (A. F. Hurst) (C) 1145, (T. Warwick) (C) 1432; life assurance and, 270; of Meckel's diverticulum, 569; prognosis of (J. J. Conybeare) (P) 1017; working capacity after (H. H. Bashford and W. L. Scott) 710; *see also* Hæmatemesis
Percaine anæsthesia (A) 623
[illegible] y (A) 34
[illegible] constrictive (P. D. [illegible] LA) 621; pain of, [illegible] virus bodies and [illegible] J. Poynton) (C) 218
Periodicals, medical (A) 955
Peritonitis—latent tuberculous (LA) 310; pain of, 794; *see also* Ascitic fluid
Perla, D., and Marmorston, J., Spleen and Resistance (R) 1300
Perott, B. A., doctor as administrator (C) 744
Perrin, W. S., death of, 1362, (O) 1439
Perry, C. B., rheumatic heart disease and vitamin C, 426, (LA) 432
Persia—Medicine in Persia (C. Elgood) (R) 26
Petavel, Sir J. E., explosion in operating theatres (C) 1327
Peterman, M. G., Pfaundler, M., and Schlossmann, A., Diseases of Children (R) 374
Peters, B. A., gold treatment of tuberculosis, 11, (LA) 85, (C) 157
Peters, E. A., Tonsils and Naso-pharyngeal Sepsis (R) 1354
Pether, G. C., cough and humidity (C) 971
Petrol, risks of (ML) 41
Petroleum poisoning, 263, (A) 675
Peyre, E., Manuel de sérologie pratique (R) 722
Pfaundler, M., Schlossmann, A., and Peterman, M. G., Diseases of Children (R) 374
Pharmaceutical, *see* Drugs
[illegible]
P[illegible] of Materia [illegible] and Thera- [illegible] 429; Introduction to Pharmacology and Therapeutics (J. A. Gunn) (R) 376; Materia Medica, Pharmacy, Pharmacology and Therapeutics (Sir W. Hale-White and A. H. Douthwaite) (R) 890; Pharma[illegible] Harrogate Drinking [illegible] (R) 307; plant [illegible] Therapie) (E. Meyer) (R) 308; *see also* Drugs
[illegible] Pharmacopœia [illegible], (S. C. Dyke) [illegible]-Holland) (C) 155; Materia Medica, Pharmacy, Pharmacology and Therapeutics (Sir W. Hale-White and A. H. Douthwaite) (R) 890; pharmacists, practitioners and population (PCP) 638, 696; training in (Sir Gowland Hopkins) 797
Pharynx, *see* Throat
Phenylmercuric salts, therapeutic application of (L. H. Biskind) 1049, (A) 1070
Phenylpyruvic amentia, inheritance of (L. S. Penrose) 192
Phillips, M. H., obstetric practice of the future, 1107; on unilateral menstrual pain, 1296
Philosophy—British Institute of Philosophy, 866, 1095, (C) 1376, (A) 1358; History of Science, Technology and Philosophy in the Sixteenth and Seventeenth Centuries (A. Wolf, F. Dannemann, and A. Armitage) (R) 195
Phosphatase, serum, source of (A) 953
Photographic method, new, 1464
Phrenic nerve operations, *see* Tuberculosis, pulmonary, surgery of
Physical Diagnosis (W. P. Elmer and W. D. Rose) (R) 196
Physical education—in schools (PI) 54, 1489; Theory of Gymnastics (J. Lindhard) (R) 25
Physical treatment—Charcot's bath, 114; congress of physical medicine, 1149, 1493; electrotherapy, 1910–35, 1001; local authority control and (PI) 51; sea-bathing, 1026; *see also* Health resorts
Physicians, *see Practitioners, medical*
Physics—Complete Physics (W. H. White) (R) 948; Science and the Human Temperament (E. Schrödinger) (A) 1247
Physiology—congress of, 446, 575; Furneaux's Human Physiology (W. A. M. Smart) (R) 558; Handbook of Physiology (*W. D. Halliburton and* R. J. S. McDowall) (R) 1184; Laboratory Manual of Physiological Chemistry (M. Bodansky and M. Fay) (R) 618; Manual of Human Physiology (Sir L. Hill) (R) 1062; medicine and (Sir H. Dale) 927, 1463; Pacemakers in Relation to Aspects of Animal Behaviour (H. Hoagland) (R) 772; perfusion, survival by (A) 34; *Range of Human Capacities* (LA) 1356; Textbook of Physiology (W. D. Zoethout) (R) 1298
[illegible] peculiar [illegible] *ney) (C)* [illegible]; Range [illegible] Wechsler) [illegible] 1016
Pickett, S. E. (O) 278
Pickles, H. D., subarachnoid hæmorrhage, 1461
Pick's disease, *see* Pericarditis
Pickworth, F. A., Chronic Nasal Sinusitis and its Relation to Mental Disorder (R) 669, (C) 1090
Pigeon, H. W., death of, 1388
Piney, A., bodily *disproportion* (C) 972; lipiodol therapy (C) 802; pain and euthanasia (C) 1432; and Wyard, S., Clinical Atlas of Blood Diseases (R) 832
Pink disease, 1196
Pitt, F. H. G., on colour vision (A) 203
Pitts, A. T., prognosis of malocclusion of teeth (P) 567
Pituitary gland—Cushing's syndrome (LA) 775, (A) 1247, 1310, suprarenal carcinoma and (D. C. Hare, J. M. Ross, and A. C. Crooke) 118; eclampsia and (A) 564; endocrine system and (Sir W. Langdon-Brown) 1155; mental disorder and, 93; migraine and (Sir E. Spriggs) 63; obesity and, 846; sphenoidal sinusitis and, 1026; tumours of, prognosis of (H. Cairns) (P) 1310, 1363; *see also* Sex hormones
Placenta—chorio-angio-fibroma, 1296; prævia, 789, (F. J. Browne) 959, Cæsarean section for (E. Holland) 1135
Placental extract in measles prophylaxis (A) 728
Plague—in Africa, 1478; prophylaxis, living vaccine for (A) 313
Plantar warts (A) 435
Plant therapy (Pflanzliche Therapie) (E. Meyer) (R) 308
[illegible] f (A) 953; [illegible] 36 [illegible] 100; of face and jaw (A) 144
Play in Childhood (M. Lowenfeld) (R) 721
P[illegible] l pneumothorax [illegible] cancer cells in, [illegible] pneumothorax for (C. Shaw) 1280, (A) 1308, (C. A. Birch) (C) 1375, (F. H. Stevenson) 1463; sensibility (S. Wright) 794; shock (LA) 1417; *see also* Empyema
Plows, W. H., death of (A) 729
Pneumococcal meningitis (D. Leys) 190
Pneumolysis, *see* Tuberculosis, pulmonary, surgery of
Pneumonia—artificial pneumothorax in (C. Shaw) 1280, (W. E. Robertson) 1282, (A) 1308, (C. A. Birch) (C) 1375; in new-born (A) 1422, 1453; Ministry of Health's memorandum on, 914; mortality from, influenza and (P. Stocks) 386, (D. Leys) (C) 581; serum treatment of (D. Leys) 67; *see also* Empyema
Pneumothorax, *see* Artificial pneumothorax
Poison gas—Catechism of Air-raid Precautions (N. Hammer) 1100; precautions against (A) 145, 261, (PI) 224, 226, 281, 346, 347, 692, 1389, 1442; vascular lesions following (J. B. McDougall and J. H. Crawford) 366, (O. Leyton) (C) 456
Poisoning—acetylsalicylic (S. C. Dyke) 613, (LA) 619, (A. M. Wyllie) 768; atropine (V. M. Métivier) 1232; carbolic acid, olive oil in (A) 623; carbon disulphide (A) 1469; corrosive (A) 1419; lead (PI) 224; mercurial, nephritis following (A) 260; morphine, proprietary remedy and (A. Renshaw) 132; *nitrous fumes and* (A) 623; volatile solvents and, 263, (A) 675
Poisons Board (PI) 226, 281, 1489
P[illegible] gainst (A) [illegible] 1; neuro- [illegible] 697, 758; [illegible]
P[illegible] *of* [illegible] 97; [illegible] in Pacific, problems of, 900
Porter, Sir J. (O) 400
Post-Certificate School, 1329

Post-graduate courses: Belfast, 956—Berlin, 406, 1181—Birmingham, 808, 1095—Dublin, 458—Fellowship of Medicine and Post-Graduate Medical Association, 55, 399, 588, 679, 806, 910, 981, 1016, 1134, 1269, 1390—Glasgow, 980—Hampstead General and North-West London Hospital, 865—Leeds, 693, 808—Royal Free Hospital, 808—St. John Clinic and Institute of Physical Medicine, 921—St. Paul's Hospital, London, 747—tuberculosis, 864—week-end (A) 779; *see also* British Postgraduate Medical School and—

POST-GRADUATE LECTURES.—Arterial obstruction in leg (G. Williams) 1020—Bile-duct, obstruction in (J. Taylor) 1140—Chronic abdominal invalid (C. J. [illegible] s of childhood [illegible] igh blood pres- [illegible] 961—Hormone therapy in gynæcology (L. Williams) 794—Inspection, direct, of larynx, lower pharynx, lower air-passages, and gullet (N. Patterson) 1019—Pain as a neurological symptom (H. A. Dunlop) 909—Placenta prævia (F. J. Browne) 959—Pulmonary tuberculosis, medical treatment of (W. E. Lloyd) 852—Pulmonary tuberculosis, surgical treatment of (Tudor Edwards) 853—Slimming problems in children and adolescents (R. Miller) 793—Visceral sensibility (S. Wright) 794—X ray treatment, results of (G. E. Vilvandré) 1265

Post-mortems, technique of (LA) 198

Post-operative—circulatory lesions (A) 259; [illegible] (Y. Henderson) [illegible] rombosis in childh [illegible] 12; pulmonary embolism (A. G. Cross) 1409; shock, 1412; tetanus (ML) 577; tetany, calciferol in (R. S. Stacey) 656; urinary fistula (V. Riddell) (C) 971

Potassium chloride in myasthenia gravis (M. B. Walker) (C) 47

Potato, food value of (A) 837

Poulton, E. P., on bracing and relaxing climates, 792

Powell, A. T., immunisation against diphtheria (C) 1145; puerperal pyrexia (C) 1268

Power, T. D., on endocrinology and mental disorder, 93

Poynton, F. J., rheumatism, bacteriology of (C) 581, (C) 742; virus bodies in pericardial fluid (C) 218

Practice, medical—group practice in America (PCP) 1086; midwifery in, 210; mortgaging of practices (PI) 54, (PCP) 1372; outlook in, 215, 512; public medical services and, 1479; Urology in General Practice (A. E. Roche) (R) 771; *see also* Contract practice

Practitioners, medical—administration by (LA) 309, (D. G. Morgan) (C) 634, (B. A. Perott) (C) 744; as company director (ML) 1481; as parliamentary candidates, 1091, 1202, 1272; certifying factory surgeon, 1388, (A) 1362; commercial exploitation and (ML) 1201; deceased, medical certificates by (ML) 1146; Doctor and the Public (J. P. Warbasse) (R) 722; Doctor Talks, A (J. McDonnell) (R) 308; For and Against Doctors (R. Hutchison and G. M. Wauchope) (A) 1191, 1216; Great Doctors of the Nineteenth Century (Sir W. Hale-White) (R) 1415; impersonations of (ML) 630, 687, 1437; in retirement (Go to the Country) (P. Gosse) 1273; insurance for, against prolonged illness, 926; Italian, patriotism and, 1215; Jewish, in Germany (A) 1131, 1216; Jewish, in Palestine (PI) 1441; Patient and Doctor (Sir H. B. Brackenbury) (R) 722, (A) 729, (LA) 833; physician as man of the world (Sir K. Wood) 854; Practitioner's Library of Medicine and Surgery: Vol. VIII. Therapeutics (G. Blumer, D. P. Smith, and A. J. Sullivan) (R) 771; proportion of, to population, 696; stickit doctor (N. G. Horner) 1039; women, married, employment of (A) 146

Pregnancy—ectopic, 1296; fibroids and, 626; prison sentence and (PI) 110; quadruplet, 1250; renal cortical necrosis in (A) 1306; surgery during, 1059; syphilis during (A) 677; tests for, fœtal death and (P. M. F. Bishop) 364; toxæmias of, 1137; tuberculosis [illegible] l Schwan- [illegible]) 24; *see* [illegible]

Prehistoric man, inquest on (ML) 631

Prescott, S. C., and Horwood, M. P., [illegible] les of Sanitary Health (R) 1061

[illegible] cost of (PCP) 274, [illegible] 143 (C. T. Norris) (C) 743; of surgical spirit (PCP) 689

Preventive medicine—development of (Sir G. Newman) 1043; Health and Human Progress (R. Sand) (R) 1465; Preventive Medicine and Hygiene (M. J. Rosenau) (R) 1061; Principles and Practice of Preventive Medicine (C. W. Hutt and H. H. Thomson) (R) 557; public health service and (LA) 949

Pridie, K. H., plaster technique, 680, 732, (LA) 723

Priest, W. M., epidural hæmorrhage due to hæmophilia, 1289

Primitive Society and its Vital Statistics (L. Krzywicki) 60

Prince of Wales's Hospital Club, 1149

[illegible] 1261, (O) 1381 [illegible] f, in Scotland [illegible] hanging, submental knot and, 985; pregnant woman's sentence (PI) 110; reform of, 1260; Sex in Prison (J. F. Fishman) (R) 1300

Proctalgia, *see* Rectum

Proctitis, *see* Rectum

Profession, medical—privileges of (J. Hay Beith) 799; *see also* Practice, medical and Practitioners, medical

Progestin, *see* Sex hormones

PROGNOSIS.—Cæsarean section (E. Holland) 1135—Cerebro-spinal fever (C. Worster-Drought) 841—Empyema, acute (C. W. G. Bryan) 91—Encephalitis, epidemic (Sir A. Hall) 147—Fibroids (V. Bonney) 626—Foreign bodies in air and upper food passages (V. E. Negus) 730—Fractures of vertebral bodies (H. E. Griffiths) 439—Gastric and duodenal ulcer (J. J. Conybeare) 1017—Hallux valgus and hallux rigidus (E. I. Lloyd) 263—Heart-block (T. East) 205—Jejunal ulcer (R. P. P. Davies) 678—Knee-joint, internal derangement of (R. C. Elmslie) 1251—Malignant growths of testicle (K. M. Walker) 1424—Malocclusion of teeth (A. T. Pitts) 567—Middle-ear suppuration (W. Howarth) 1071—Non-malignant diseases of the breast (E. P. Gould) 899—Papilloma of bladder (C. A. R. Nitch) 781—Pituitary tumours (H. Cairns) 1310, 1363—[illegible] tions of the skin (H. W. Barber) 35—Tetanus (L. Cole) 957—Tuberculous infections of skin (H. C. Semon) 1474—Ulcerative colitis (A. F. Hurst) 1194

Prognosis series (THE LANCET), first volume of, 625

Prosser White Oration, 287

Prostate—enlarged, treatment of, 1414; prostatectomy, 903

Prostigmin, reduced cost of, 592

Prostitution, *see* Venereal disease

Protein shock, *see* Pyrotherapy

Pruritus—(Lord Horder) 287; X ray treatment of (W. Collins) (C) 404, 1265

Psittacosis—(S. Johnson and W. Levinthal) 373; complement-fixation reaction in (S. P. Bedson) 1277

Psychiatry—Biology of the Individual (J. R. Hunt, T. K. Davis, and A. M. Frantz) (R) 1182, (A) 1189, 1300; Crook Frightfulness (R) 832; digressions on, 827; four decades of, 93; in schools of law (ML) 969; research on, donations for (LA) 952; war mentality and, 907, (J. H. Moynihan) (C) 1031; Year Book of Neurology, Psychiatry and Endocrinology (H. H. Reese, H. A. Paskind, and E. L. Sevringhaus) (R) 1241; *see also* Mental disorder and—

Psychology—Briefer General Psychology (G. Murphy) (R) 1298; diploma in [illegible] 1269; Founda- [illegible] (J. M. Dorsey) [illegible] conceptions of, [illegible] on, to nurses, 866; maternal protection hypothesis, 1210; of children, up-bringing and, 340, 1215, (R. Miller) 1393, 1410; of electorate (LA) 1127; of pain, 911; Play in Childhood (M. Lowenfeld) (R) 721; psycho-analysis and, 1215; Psychological Aspects of Child Development (S. Isaacs) 695; Psychology of Everyman (G. Devine) (R) 1416; schools of (A) 897; teaching of, 41, (LA) 1185, (R. A. Noble) (C) 1327; (C. Allen) (C) 1328; *see also* Institute of Medical Psychology, Mental disorder, and Nervous disorder

Psychoses, *see* Mental disorder

Puberty—pubertas præcox (A) 32; striæ atrophicæ of (F. P. Weber) 885, 1347; *see also* Adolescence

Public [illegible] its and (PI) [illegible] chronic sick [illegible] medical admi [illegible]; unemployment benefit and (PI) 1383

Public health—British Medical Associa- [illegible]; coloured [illegible] PI) 166; [illegible] (R. Sand) [illegible] 280, 1200; in Iceland (LA) 1129; in Ireland, 450, 918; in Leicester, 1270; in Scotland, 154; in United States, 154, lay [illegible] 1082; in Wales, [illegible] LA) 835; Ministry [illegible] f (PI) 220; pre- [illegible] (Sir G. Newman) [illegible] nciples of Sanitary Health (S. C. [illegible] Horwood) (R) 1330, 1382, 1441, [illegible] in (LA) 949

PUBLIC HEALTH.—Anthrax in shaving brush, 160—Botulism, 452, 584, 639—Farmer's diet, 341—Food-poisoning at Nelson, 160, 584—Gas heating of flueless rooms, 398—Housing Act, 862—London County Council hospitals: nursing in, 275; out-patients at, 1035—Lourdes pilgrimage, sequel to, 452—Manchester hospitals, 452—Maternal mortality, 50, 159—Midwives: national maternity service and, 1374; salaried service of, 219—Milk, consumption of, 342—Ministry of Health reports, 584, 913—Nutrition: centres in London, 276; records of, 968; world survey of, 341—Paratyphoid outbreaks, 50, 805—Pneumonia, 914—Public Health Bill, 969—Puerperal pyrexia, 1087—Record keeping, 740—River Tees, pollution of, 1322—Scarlet fever mortality, 806—School-children: chief medical officer's report, 1440; meals for, 342—School medical service, 863—Scottish health services, 739—Sore-throat, curious epidemic of, 740—Special schools or special classes, 101—Swimming baths, infection in, 740—Typhus fever, doubtful case of, 864—Ultra-violet treatment by laymen, 1144—Vital statistics of 1934, 1034—Water purification, ozone for, 1374—Water-supplies, 102

Public Ill Health (C. E. McNally) (R) 617

Public medical services—conference, 1479; in Edinburgh, 1260

Puerperal—melancholia, crime and (ML) 631; Puerperal Gynæcology (J. L. Bubis) (R) 1465; *see also*—

Puerperal infection—*B. fæcalis alkaligenes* and (W. M. Brown and W. Stewart) 718; epidemiology of (P. M. Congdon) 1287, (LA) 1302, 1433; notification of, 1087, (A. T. Powell) (C) 1268; remote results of, 1138

Pulmonary, *see* Lung and Tuberculosis, pulmonary

Punctate basophilia, chrysotherapy and (G. J. Griffiths and J. Race) 714

Purpura—hæmorrhagica, caused by gold and arsenical compounds (E. H. Hudson) 74, (LA) 85; vitamin C in (H. Engelkes) 1285

Purser memorial lecture, 647

Purves-Stewart, Sir J., on obesity, 846

Pye, E. M., independent midwife (C) 1088

Pyelitis—(A. Ellis) 127, (LA) 140; in childhood (A) 777

Pyke, M. A., contraceptive methods (C) 1268

Pylorus, *see* Stomach

Pyosalpingitis, *see* Salpingitis

[illegible] hay-fever [illegible] præcox (D. Menzies) 994; in gonorrhœa (A. H. Bartley) (C) 743, (J. J. Abraham) (C) 802; in undulant fever (G. E. Beaumont and A. P. M. Page) 940, (S. Miller) (C) 1030

Pyuria in children (A) 777

Q

Quackery, *see* Unregistered practitioners
Quadruplets in Holland, 1250
Queen's Institute of District Nursing, 1041
Quetta earthquake—awards, 1211 ; casualties, after-care of, 285, 925 ; hospitals appeal, 1268
Quinine—amblyopia (S. Tibbles) (C) 1089 ; as contraceptive (A) 1133

R

Rabies—anti-rabies institute, 736 ; carbolised vaccine for, 579 ; neurotropic virus of (E. W. Hurst) 697, 758
Rabinowitsch-Kempner, L., death of (A) 318
Race, J., punctate basophilia after chrysotherapy, 714
Racial pressure problems in Pacific, 900
Radiograpl[illegible] 1297 ; Groedel's [illegible] in der Inneren [illegible] (R) 890 ; Ilford Radiographic Department, 1389 ; in inverted position (L. S. T. Burrell) (C) 48 ; kymography and (LA) 432 ; limitations of, 1099 ; Radiological Atlas of Chronic Rheumatic Arthritis (Hand) (S. G. Scott) (R) 669 ; ventriculography (E. W. Twining and G. F. Rowbotham) 122, 1368 ; *see also*—
Radiography of—acute abdomen (A), 202 ; anomalies of intestinal rotation (E. L. Rubin) 1222 ; bone tumours, 1199 ; breast tumours (A) 776 ; gastric carcinoma, 1368 ; lung diseases, 1198, 1368 ; post-operative circulatory lesions (A) 259
[illegible] ew Zealand [illegible] ; congress [illegible] ; *see also* Radiography, Radium, and X rays
Radiotherapy, *see* Radium and X rays
Radium—*Bodo caudatus*, irradiation of (A) 675, 1193 ; bomb, 652, (A) 675, 868, 1193 ; medical uses of, 1083, (A) 1192 ; National Radium Commission, 808 ; protection from, by building materials (A) 1192 ; Radium Treatment (F. H. Williams) (R) 1240 ; tell-tale, 868 ; *see also* Cancer and Cancer of
Rae, A. M. W., appointment, 588
Range of Human Capacities (D. Wechsler) (LA) 1356
Ranson, S. W., Anatomy of the Nervous System (R) 1466
Raven, H. M., on convalescence on Thanet coast, 791
Rawlins, M., gonococcal proctitis of females (C) 158
Ray, S. N., vitamin-C subnutrition, 1399
Rayner, H. H., on enlarged prostate, 1414
Rectum—cancer of, radium in, 1083 ; fæcal incontinence (J. Hartsilver) 427 ; gonococcal infection of (P. A. Clements and K. E. A. Hughes) 18, (M. Rawlins) (C) 158 ; hæmorrhage from, diagnosis of (A) 1067 ; Modern Treatment of Hæmorrhoids (J. F. Montague) (R) 196 ; proctalgia fugax (Th. E. H. Thaysen) 243, (J. A. Ryle) (C) 343, (C. Howard) (C) 343, (H. S. Carter) 372, (W. Blyth) (C) 404, (C) 404, (A. Abrahams) (C) 455, (R. M. Tecon) (C) 455, (P. McEwan) (C) 580, (R. N. C. Smith) (C) 581, (C) 581, (H. Beckman) (C) 634, (W. H. Marshall) (C) 634, (H. Carlill) (C) 742 ; resection of, for cancer (D. P. MacGuire) 1114, (J. P. Lockhart-Mummery) (C) 1207 ; resection of, with restoration of continuity (C. A. Pannett) 423
Reese, H. H., Paskind, H. A., and Sevringhaus, E. L., Year Book of Neurology, Psychiatry and Endocrinology (R) 1241
Referees, medical—delay in examination by (PI) 224
Refugees—Academic Assistance Council, work of (A) 317
Registrar-General, *see* Vital statistics
Rehabilitation, *see* Injuries
Reilly, M. G., and Swartz, J. H., Diagnosis and Treatment of Skin Diseases (R) 889
Religion—Science and Religion (N. Bishop Harman) (R) 831
Remedies, *see* Drugs
Renal, *see* Kidney and Nephritis
Rennie, J. B., azotæmia in acute Bright's disease, 658
Renshaw, A., morphine poisoning, proprietary remedy and, 132

REPORTS AND ANALYSES.—Moussec (Moussec Ltd.) 26

Research—at Royal College of Surgeons (A) 143 ; Beit Memorial Trust, 153 ; epochs in (Sir H. Dale) 927 ; Imperial Cancer Research Fund report, 1315 ; in Ireland, funds for, 1318 ; in Shanghai (A) 316 ; internationalism and (A) 317, 446 ; Leverhulme research fellowships, 169 ; neurological and psychiatric (LA) 952 ; on asthma (A) 1191 ; on cancer, 410, (A) 1249 ; Rockefeller Foundation (LA) 952, 981 ; scholarship in tuberculosis, 1148 ; state grants for (PI) 110 ; studentship in oto-laryngology, 1269 ; *see also* Clinical science and Medical Research Council
Research Defence Society—Stephen Paget lecture (A) 436
[illegible] coramine, and, [illegible] during birth (Sir [illegible] scovery of (Sir H. [illegible] Anoxæmia, Artificial respiration, Inhalation therapy, and Respiratory efficiency
Respiratory diseases—in new-born (A) 1422, 1453 ; mortality from, influenza and (P. Stocks) 386, (D. Leys) (C) 581 ; ward infection and (E. H. R. Harries) 173, 233
Respiratory efficiency—muscle tonus and (Y. Henderson) 178 ; nasal airway and (Sir L. Hill) 70 ; test of (A) 778
Resuscitation, *see* Artificial respiration and Inhalation therapy
Reticulocyte, *see* Anæmia
Rettger, L. F., Levy, M. N., Weinstein, L., and Weiss, J. E., Lactobacillus Acidophilus (R) 721
Reynolds, R., on cineradiography, 1297
Reynolds, W. C., germicidal properties of mercury preparations (C) 917
Rheumatism—anæmia and (D. H. Collins) 548 ; Arthritis and Rheumatoid Conditions (R. Pemberton) (R) 1465 ; British Committee on Chronic Rheumatic Diseases, report (A) 30 ; gold in (S. J. Hartfall and H. G. Garland) 8, (LA) 85, (G. Slot and P. M. Deville) (C) 157, (R. Ellis) (C) 276, punctate basophilia and (G. J. Griffiths and J. Race) 714 ; headaches and (Sir E. Spriggs) [illegible] plasma [illegible] tion-rat[illegible] in, 921 ; Radiological Atlas of Chronic Rheumatic Arthritis (Hand) (S. G. Scott) (R) 669 ; Rheumatic Diseases (F. Bach) (R) 429 ; streptococcal fibrinolysis in (C. H. Stuart-Harris) 1456 ; tuberculosis and (W. S. C. Copeman and R. D. Clay) 1460 ; virus bodies in joint fluid (A. C. Coles) 125
Rheumatism, juvenile—(K. D. Wilkinson) 411 ; bacteriology of (F. J. Poynton) (C) 581, 742, (K. D. Wilkinson) (C) 691 ; heart disease and (A) 777, vitamin C and (C. B. Perry) 426, (LA) 432 ; in India (A) 146 ; Rheumatic Diseases (F. Bach) (R) 429 ; salicylates in (LA) 619 ; streptococcal fibrinolysis in (C. H. Stuart-Harris) 1456 ; subcutaneous nodules and (G. Davison) 1057 ; virus bodies in pericardial fluid (A. C. Coles) 125, (F. J. Poynton) (C) 218
Rhinorrhœa, vasomotor (A. Tumarkin) 826
Rhodes, E. C., and Hartog, Sir P., International Institute Examinations Enquiry (LA) 1303
Ribs, fractured, in whooping-cough (W. Edgecombe) 374
Rice, D. (O) 347
Richards, H. A., on teaching of anæsthetics (A) 1069
Richardson, W. G. (O) 1147
Richet, C. (O) 1380, work of (A) 1419
Richmond, A. H. D., electrocution, 16
Riddell, J. R. (O) 49
Riddell, V., arterial embolectomy, 1230 ; urinary fistula following appendicectomy (C) 971
Riddoch, J. W., on surgical shock, 1412
River pollution, *see* Sewage
Rivers, C. H., self-retaining vaginal speculum (NI) 305
Road accidents—alcohol and, 207, (A) 259, (PI) 346 ; courts for (ML) 969 ; in France, 337 ; mental deficiency and (LA) 672 ; mortality of young adults and (A) 674 ; panel practitioners and (PCP) 1372 ; *see also* Motorists
Road to Modern Science (H. A. Reason) 1445
Roberts, E. (O) 1381
Roberts, H., Everyman in Health and in Sickness (LA) 833 ; and Browne, F. W. S., and Ludovici, A. M., Abortion, 1446
Roberts, J. E. H., on pleural and pulmonary sepsis (A) 674
Robertson, M., on irradiation of *Bodo caudatus* (A) 675, 1192
Robertson, W. E., artificial pneumothorax in lobar pneumonia, 1282, (A) 1308
Robinson, D. T., diphtheria in Manchester, 441
Roche, A. E., Urology in General Practice (R) 771
Rockefeller Foundation—gifts to research (LA) 952, 981, 1084 ; medical fellowships, 112
Rogers, L., euthanasia (C) 1485
Rogers prize, 1149
Rolleston, C., regulation of prostitution (C) 1485
Romanis, W. H. C., aneurysms, 1275
Ronaldson, G., on diphtherial paralysis, 80
Rose, W. D., and Elmer, W. P., Physical Diagnosis (R) 196
Rosenau, M. J., Preventive Medicine and Hygiene (R) 1061
Rosenheim, M. L., duodenocolic fistula simulating idiopathic steatorrhœa, 764 ; mandelic acid (C) 741
Rosenthal, D. B., on pleural effusion in artificial pneumothorax, 1027 ; perforation of tuberculous intestine, 882
Ross, J. M., Cushing's syndrome, 118, (LA) 775
Ross, T. A., on neuroses, 41, (LA) 1185
Rowbotham, G. F., ventriculography by opaque injection, 122
Rowbotham, S., cyclopropane anæsthesia, 1110, (A) 1362
Roy, D., on breech presentations, 942
Royal Air Force—medical rejections of recruits (PI) 1442
Royal Australasian College of Surgeons—fellowships, 785 ; Hamilton Russell [illegible] fellowship, 1148 ; laboratory report, 406 ; Morison lectures, 41, (LA) 1185 ; neuroses, 41 ; pass lists, 349, 1036
Royal College of Physicians of Ireland—meeting, 970
Royal College of Physicians of London—appointments, 282, 1094 ; Bradshaw lecture, 1016 ; Croonian lectures, 1, 63 ; Diploma in Child Health (LA) 773 ; diplomas, 167, 283, 921, 1094, 1210, 1443 ; elections, 1094 ; Harveian Oration, 927, 1158 ; lectures, 1016 ; licences, 167, 282, 1094 ; medals, 282 ; members, 282, 283, 1094 ; Milroy lectures, 173, 233 ; officers, 282 ; pass list, 348 ; rheumatic diseases (A) [illegible]
[illegible]urgh—[illegible], 1492 ; [illegible]036
[illegible]gland—[illegible] 1443 ; [illegible] Buckston Browne dinner, 1204 ; demonstrations, 921 ; Diploma in Child Health (LA) 773 ; diplomas, 167, 283, 921, 1094, 1210, 1443 ; elections, 111, 146, 167, 1210, 1443 ; fellow, 921 ; hospitals approved for surgical practice for F.R.C.S., 283, 1210 ; Hunterian Hunterian lecture, 355 ; Hunterian museum (A) 143 ; lectures, 729, 921 ; licences, 167, 282, 1094, 1443 ; medals, 921 ; meeting, 1258 ; members, 283, representation of, on Council, 1258 ; museum, gifts to, 60 ; pass lists, 348, 1492 ; presidential election, 146, 167 ; prize, 167 ; research (A) 143 ; scholar, 921 ; Thomas Vicary lecture, 1309
Roya[illegible] of [illegible] 121[illegible] 1388 ; pass lists, 349, 1036
Royal Institute of Public Health—Harben lectures, 747
Royal Institution—election, 112 ; lectures, 921; 1443

Royal Medical Benevolent Fund—medical refugees' contribution to (L. G. Glover) (C) 1208 ; Xmas appeal (Sir T. Barlow) (C) 859, (A) 836, (C) 1145
Royal Medical Benevolent Fund of Ireland, 1493
Royal Sanitary Institute—1210, 1493 ; Benjamin Ward Richardson lecture, 980 ; herd immunity (LA) 141 ; Housing Act, 862 ; industrial medicine (LA) 378 ; locust, problem of (A) 623
Royal Society—elections, 1209 ; medal, 1209 ; national food policy (A) 1305
Royal Society of Arts, 1148
Royal Surgical Aid Society—annual report (A) 88 ; meetings, 1329, 1389
Royce research fellowships, 921
Rubber bulbs, manufacture of, 591
Rubin, E. L., anomalies of intestinal rotation, 1222
Rumboll, C. F. (O) 1036
Russell, H. B., Cambridge electrode jelly, 1172
Russell, J. C., on medical authors of the thirteenth century, 646
Russell, W. R., amnesia following head injuries, 762
Russell's viper venom in hæmophilia (LA) 893
Rutherfurd, W. J., hæmophilia and infantile mortality (C) 1378
Ryle, J. A., achlorhydria in pyloric carcinoma (C) 46 ; Aims and Methods of Medical Science (LA) 1301, 1468 ; proctalgia fugax (C) 343 ; regius professor of physic, 641, 694, 1134

S

St. Bartholomew's Hospital Medical College, opening of, 1065
St. George's Hospital Medical School, 986
St. John Clinic and Institute of Physical Medicine—post-graduate course, 921
St. Mary's Hospital Medical School—dinner, 169 ; post-graduate lectures, 793
St. Thomas's Hospital Medical School—anatomy department (A) 1191
Saleh, A. H., duodenocolic fistula, 1117
Salivary glands—Mucous and Salivary Gland Tumours (H. E. Ahlbom) (R) 1415 ; submaxillary calculus, 1446 ; tumour of (D. C. L. Fitzwilliams) 769
Salmon, furunculosis in (A) 1066
Salmonella newport, pyosalpinx and (D. Brown) 1173
Salpingitis—prognosis of (A. Bourne) (P) 331 ; suppurative, due to *S. newport* (D. Brown) 1173
Salt, *see* Sodium chloride
Samson, E., Commonsense Dentistry (R) 137
Samuel, D. (O) 163
Sanatorium—for French students, 688 ; school, 1038 ; treatment, artificial pneumothorax and, 1123 ; village, French (A) 676
Sand, R., Health and Human Progress (R) 1465
Sarcoma—avian (A) 1250 ; familial incidence of (A) 437 ; melanotic (E. S. Horgan) (C) 156, (W. R. Snodgrass) 668
Savage, W. G., on tendencies in public health service (LA) 949
Save the Children Fund (A) 897
Savill, A., The Hair and Scalp (R) 1126
Sayid, I. A., auricular fibrillation after emetine injection, 556
Scabies—in mental hospital (F. E. Kingston) 815, (R. Eager) (C) 917 ; treatment of (R. G. Shaw) (C) 45
Scapulæ of primitive type (V. J. Kinsella) 303
Scarlet fever—immunisation against (LA) 773, (W. R. F. Collis) (C) 859 ; mortality from, 806 ; streptococcal fibrinolysis in (C. H. Stuart-Harris) 1456 ; swimming bath infection and, 740, (J. C. Sleigh) (C) 803
Schinz, H. R., and Buschke, F., Krebs und Vererbung (R) 136
Schistosomiasis—dermatitis and, 451 ; in British Colonies, 1200
Schliephake, E., Short Wave Therapy (R) 1126
Schlossmann, A., Pfaundler, M., and Peterman, M. G., Diseases of Children (R) 374
Scholarships for sons of medical men, 1037
School-children—chief medical officer's report, 1440 ; detection of defects in (LA) 197 ; gas mask drill and (PI) 281 ; health of (PI) 1330, 1440 ; infectious disease in schools, old books and (PI) 1442 ; meals and milk for (PI) 110, 165, 227, 1383, 1489, 342 ; nutrition of (PI) 221, 968, (LA) 951, 1440, (PI) 1489 ; otorrhœa in (LA) 724 ; physical training for (PI) 54, 1489 ; squint training clinic for (M. Thornett-Johnson) 183 ; *see also*—
School Medical Service—lectures, 1036 ; progress of, 863
Schools—biology in, 925 ; black-listed (PI) 1489 ; National Special Schools Union, conference, 101 ; preparatory, medical officer's problems in, 1177
Schorstein lecture (A) 955
Schrödinger, E., Science and the Human Temperament (A) 1247
Science—British Scientists of the Nineteenth Century (J. G. Crowther) (R) 196 ; History of Science, Technology, and Philosophy in the Sixteenth and Seventeenth Centuries (A. Wolf, F. Dannemann, and A. Armitage) (R) 195 ; Science and Religion (N. Bishop Harman) (R) 831 ; Science and the Human Temperament (E. Schrödinger) (A) 1247
Scotland—bovine phthisis in (A. S. Griffith and J. Smith) 1339 ; health services in (PI) 52, 266, 739 ; housing in (PI) 52, 108 ; maternal mortality in, 159 ; No Mean City : A Story of the Glasgow Slums (A. McArthur and H. K. Long) (R) 1007 ; nurses' training in, 266 ; prison administration in (PI) 108, 167

SCOTLAND, CORRESPONDENCE FROM.—"Acute abdomen" in childhood, 1370—Edinburgh Royal Infirmary, 1318—Edinburgh's health, 154—Edinburgh University, 1084—Fats in the blood, 1318—Hospitals, 1084—Medical curriculum, 1029—Medical graduates, outlook for, 215—Medicine, changing conceptions in, 970—Neuroses in medical practice, 41—Prison reform, 1260—Public medical service, 1260

Scott, A. M., acholuric jaundice, 872
Scott, H. H., appointment, 588
Scott, S. G., Radiological Atlas of Chronic Rheumatic Arthritis (Hand) (R) 669
Scott, W. L., working capacity after duodenal and gastric ulcers, 710
Scowen, E. F., gonadotropic hormones for undescended testes, 1335, (LA) 1355
Sculptor, medical, 868
Scurvy—Barlow, Sir T., work of (LA) 431 ; in adult (P. Wood) 1405 ; Stark, W., and, 459, (LA) 431 ; *see also* Vitamin C
Sea-bathing, therapeutic application of, 1026
Sear, H. R., on diagnosis of bone tumours, 1199
Secret remedies, 97, (LA) 83, 207
Seddon, H. J., caries of thoracic spine, 355
Sellors, T. H., hæmatemesis, surgery and (C) 973
Selye, H., water and fat metabolism, liver function and, 297
Semilunar cartilage, *see* Knee-joint
Semon, H. C., prognosis in tuberculosis of skin (P) 1474
Semon lectures, 921, (A) 1066
Septic, *see* Streptococcal
Septicæmia, *B. fæcalis alkaligenes* and (W. M. Brown and W. Stewart) 718
Serbia—Healing Ritual : Studies in the Technique and Tradition of the Southern Slavs (P. Kemp) 751
Serology, manual of (Manuel de sérologie pratique) (É. Peyre) (R) 722
Serum, *see* Plasma

SERVICES, THE.—Army Medical Services : [illegible] 1 [illegible] 3 [illegible] the Services : 585, 745, 919, 1033, 1262, 1311, 1379—Indian Medical Service : 148, 219, 263, 318, 399, 457, 537, 585, 640, 745, 783, 857, 958, 1033, 1093, 1205, 1262, 1311, 1379, 1483—Parkes Memorial Prize, 1205—Royal Air Force : 44, 148, 219, 262, 318, 399, 457, 537, 585, 640, 679, 745, 783, 857, 919, 958, 1033, 1093, 1146, 1205, 1262, 1311, 1379, 1438, 1483—Royal Army Medical Corps : 44, 92, 219, 262, 318, 399, 457, 537, 585, 640, 679, 745, 782, 857, 919, 958, 1033, 1093, 1146, 1205, 1262, 1311, 1379, 1438, 1483—Royal Naval Medical Service : 44, 92, 148, 218, 262, 318, 399, 457, 537, 585, 640, 679, 745, 782, 857, 919, 958, 1033, 1093, 1146, 1205, 1262, 1311, 1379, 1438, 1483

Sevringhaus, E. L., Reese, H. H., and Paskind, H. A., Year Book of Neurology, Psychiatry and Endocrinology (R) 1241
Sewage—Beddington scheme (PI) 165, 226 ; River Tees and, 1322 ; water pollution in United States, 1369
Sewer-worker, Weil's disease in (J. Maxwell) 998
Sex—infibulation (J. M. Melly) 1272 ; Sex (K. Walker) (R) 1353 ; Sex in Prison (J. F. Fishman) (R) 1300 ; *see also* Marriage
Sex hormones—androsterone, derivatives of (R. K. Callow and R. Deanesly) 77 ; Application of Absorption Spectra to the Study of Vitamins and Hormones (R. A. Morton) (A) 897 ; corpus luteum hormone, nomenclature of (W. M. Allen, A. Butenandt, G. W. Corner, and K. H. Slotta) (C) 454, (A) 438 ; cortical carcinoma of suprarenal and (D. C. Hare, J. M. Ross, and A. C. Crooke) 118 ; eclampsia and (A) 564 ; eunuchoidism and (E. H. Capel) 886 ; gynæcological uses of (L. Williams) 794, (LA) 1467 ; in treatment of undescended testes (A. W. Spence and E. F. Scowen) 1335, (LA) 1355, (D. Browne) (C) 1484 ; œstrin, growth and (Sir W. Langdon-Brown) 1159 ; ovarian and pituitary (Hormones des Ovariums und des Hypophysenvorderlappens) (B. Zondek) (R) 1240 ; pituitary tumours and (H. Cairns) (P) 1310 ; progestin from whales (A) 1189 ; pubertas præcox and (A) 32 ; research on (Sir H. Dale) 927 ; sterility and (A) 1246 ; vulvo-vaginitis, œstrin in (A) 1070 ; *see also* Endocrine system
Shackle, J. W., bleeding of transfusion donors (C) 158, 276
Shakespeare's son-in-law, 1332
Shark arm case (ML) 40, 687
Shaw, C., artificial pneumothorax for pleural pain, 1280, (A) 1308 ; gold treatment of tuberculosis (C) 105
Shaw, F. (O) 1487
Shaw, H. Batty, tuberculosis, pulmonary, bi-lateral collapse therapy in (C) 155
Shaw, M. E., hæmatemesis, surgery and (C) 1030
Shaw, R. G., treatment of scabies (C) 45
Shaw, R. W., on Münchmeyer's disease, 1239
Shaw, W. F., election, 169
Sheldon, J. H., Hæmochromatosis (R) 1298 ; on exophthalmic goitre, 1297
Sherry party (A) 1359
Shillitoe, A., death of, 204, (O) 402
Shipway, Sir F. E., toxicity of avertin (C) 343
Shivering (A) 381
Shock—pleural (LA) 1417 ; surgical, 1412 ; *see also* Electric shock
Short, A. R., and Tidy, H. L., Medical Annual, 1935 (R) 558
Short, C., gold treatment of tuberculosis, 11, (LA) 85, (C) 157
Short wave therapy—(Sir L. Hill) (C) 158 ; Artificial Sunlight (M. Luckiesh) (A) 1189 ; Grundriss der Kurzwellentherapie (W. Holzer and E. Weissenberg) (R) 1125 ; Kurz- und Ultrakurzwellen (P. Liebesny) (R) 1125 ; Short Wave Therapy (E. Schliephake) (R) 1126
Shoulder—L'epaule (A. Basset and J. Mialeret) (R) 26
Shrubsall, F. C. (O) 804
Shumway, W., Introduction to Vertebrate Embryology (R) 1241
Siegel's speculum, modified (A. Miller) (NI) 81
Sigmoid, resection of (D. P. MacGuire) 1114, (J. P. Lockhart-Mummery) (C) 1207
Silicosis, *see* Lung
Simmons, H. T., surgery of primary skin carcinoma, 938
Simon, Sir E. D., and Inman, J., Rebuilding of Manchester (A) 677
Simpson, R. E. H., toxicity of avertin (C) 404
Simpson, S. L., sodium and the suprarenals (C) 106
Sinclair, A. M. R. (O) 1381
Singer's nodule (LA) 27
Singh, I., on intravenous oxygen (A) 380 ; raw eggs for insomnia and neurasthenia (C) 636
Sinuses—antral infection of dental origin (E. C. N. Strong and I. B. Barclay) 131 ; asthma and (A) 1246 ; Chronic

Nasal Sinusitis and its Relation to Mental Disorder (F. A. Pickworth) (R) 669, (C) 1090, (T. C. Graves) (C) 1484; foreign bodies in (V. E. Negus) (P) 730; frontal, infection of (T. B. Layton) 1345, 1349; headaches and (Sir E. Spriggs) 1, 63; tuberculosis of, irradiation in (W. A. Troup) 667; *see also* Sphenoidal sinusitis
Skeleton, *see* Bone
Skin—adhesive strapping and (A) 382, (R. S. Woods) (C) 580, (A. D. Wright) (C) 580, (S. McAusland) (C) 635; bather's itch, 451; boils, origin of (L. P. Lockhart) (C) 861, (A. Whitfield) (C) 916; cancer of, surgery of (H. T. Simmons) 938; carcinoma telangiectaticum (A) 1013; classification of skin diseases, 1079; Diagnosis and Treatment of Skin Diseases (J. H. Swartz and M. G. Reilly) (R) 889; diseases of, in Australia, 1073; disinfection of (A) 838, (W. C. Reynolds and S. N. H. Stothart) (C) 917, (J. G. Baumgartner and M. D. Wallace) (C) 1031; dye dermatitis (J. T. Ingram) 239; excretory function of, 1079; Hair and Scalp (A. Savill) (R) 1126; International Dermatological Congress (A) 436, 1078, (LA) 1243; mycological infections of, 1074; nervous disorder and (LA) 1063; pruritus (Lord Horder) 287, (W. Collins) (C) 404; scabies in mental hospital (F. E. Kingston) 815, (R. Eager) (C) 917; scabies, treatment of (R. G. Shaw) (C) 45; staphylococcal infections of, 1073; streptococcal infections of, prognosis in (H. W. Barber) (P) 35; striæ atrophicæ of puberty (F. P. Weber) 885, 1347; treatment obtained by fraud, 286; tuberculosis of, 1265, prognosis in (H. C. Semon) (P) 1474; vitamins and, 1079; X rays in skin diseases (G. E. Vilvandré) 1265
Skull—dysostosis cleidocranialis (V. J. Kinsella) 303; *see also* Head
Sleep, *see* Insomnia
Sleeping sickness, *see* Trypanosomiasis
Sleigh, J. C., infection in swimming baths (C) 803
Slemons, M., on John Whitridge Williams (A) 1421
Slimming, *see* Obesity
Slot, G., gold treatment of rheumatoid arthritis (C) 157; on drunkenness (A) 31
Slotta, K. H., corpus luteum hormone (C) 454, (A) 438
Small-pox—alastrim and, 1236, (A) 1305; cow-pox and, 943; *see also* Vaccination
Smallwood, W. C., on ascorbic acid (LA) 432
Smart, A. G. B., appointment, 1444
Smart, W. A. M., Furneaux's Human Physiology (R) 558
Smellie, J. M., intranatal and neonatal death, 1453
Smith, D. P., Blumer, G., and Sullivan, A. J., Practitioner's Library of Medicine and Surgery: *Vol VIII. Therapeutics* (R) 771
Smith, E. C., Hodgkin's disease in Nigerian natives, 874, (A) 895
Smith, F. C., hæmoglobin estimation, 661
Smith, G. Van S., on sex hormones in pregnancy (A) 564
Smith, Sir H. L., New Survey of London Life and Leisure, 59
Smith, J., bovine phthisis, 1339
Smith, J. F., and Paterson, D., Modern Methods of Feeding in Infancy and Childhood (R) 832
Smith, O. W., on sex hormones in pregnancy (A) 564
Smith, R. N. C., proctalgia fugax (C) 581
Smith-Petersen nail, director for (E. I. Lloyd) 129, (R. Watson Jones) (C) 217
[illegible] pollution
[illegible]; and perforated duodenal ulcer, 15; hæmatemesis, surgery and (C) 1090
Snake venom in hæmophilia (LA) 893
Snodgrass, W. R., free melanin-bearing cells in ascitic fluid, 668
Sobhy, G. P. G., gold treatment of asthma (C) 156
Social survey—Local Social Survey in Great Britain (A. F. Wells) 1100
Societies, medical, in London, 1092

SOCIETIES, MEDICAL

ASSOCIATION OF CERTIFYING FACTORY SURGEONS.—(A) 1362; dinner, 1388

ASSOCIATION OF CLINICAL PATHOLOGISTS.—Diphtheria, 250; glandular fever, 251; whooping-cough, 250

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.—808; (N. H. Mummery) (C) 1031

BRISTOL MEDICO-CHIRURGICAL SOCIETY.—Obstetric practice of the future, 1107

BRITISH ASSOCIATION OF RADIOLOGISTS.—Presidential address, 195

BRITISH ORTHOPÆDIC ASSOCIATION.—Bone absorption, 1257; epicondylar fractures, 1257; meeting, 866; os calcis, fractures of, 1256; torticollis, 1257

BRITISH PSYCHOLOGICAL SOCIETY.—Nullity and impotence, 1233

CALEDONIAN MEDICAL SOCIETY.—Dinner, 170

CHELSEA CLINICAL SOCIETY.—Dinner, 922

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—"Acute abdomen" in childhood, 1370

EDINBURGH PATHOLOGICAL CLUB.—Fat content of blood, 1318

EXETER MEDICO-CHIRURGICAL SOCIETY.—Hypertension, 350

FELLOWSHIP OF MEDICINE.—Maternal mortality, 1254

HARVEIAN SOCIETY OF LONDON.—Buckston Browne prize, 1209

HUNTERIAN SOCIETY.—Birth control debate, 1180; chronic sick, challenge of, 887, (A) 897

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.—Presidential address, 974

IRISH MEDICAL ASSOCIATION.—Meetings (A) 90, 106

LIVERPOOL MEDICAL INSTITUTION.—Bone and joint infections, 1119; cineradiography, 1297; coronary thrombosis, 1004; ephedrine in enuresis, 1119; malignant effusions, 1297

LOCAL GOVERNMENT MEDICAL OFFICERS' ASSOCIATION OF ENGLAND AND WALES.—(A) 836

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—Physiology and medicine, 1463

MANCHESTER MEDICAL SOCIETY.—Enlarged prostate, 1414; osteoarthritis and its concomitants, 1005

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—Preparatory schools, problems of medical officer in, 1177

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.—Meeting, 170; psychopathology, 1210; schools of psychology (A) 897

MEDICAL SOCIETY OF LONDON.—Difficult children, 1393, 1410; electrical injuries, 1002, (LA) 1010; insulin, 1235; Lettsomian lectures (A) 674; presidential address, 982; programme, 458

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.—Elections, 1149

MEDICO-LEGAL SOCIETY.—Dinner, 1442; drunkenness (A) 31; forensic chemist (A) 1013; meeting, 864; nullity and impotence, 1233

MEDICO-LEGAL SOCIETY OF VICTORIA.—Judicial hanging, 985

MIDLAND MEDICAL SOCIETY.—Surgical shock, 1412

MID-STAFFORDSHIRE MEDICAL SOCIETY.—Hæmatemesis, 811

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—Tuberculosis in children, nation's responsibility and, 37

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.—American maternity hospital, 1213; carcinoma cervicis, 1464; chorio-angiofibroma, 1296; ectopic pregnancy, 1296; menstrual pain, unilateral, 1296; ovariotomy, 1463; vitamins in habitual abortion, 1464

NORTH-WESTERN TUBERCULOSIS SOCIETY.—Phrenic nerve operations, 418; tuberculosis, pulmonary, treatment of, 1179

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—Undulant fever, 1449

ROYAL ACADEMY OF MEDICINE IN IRELAND.—866; carcinoma of uterus 1058; Dublin maternity hospitals (A) 563; fibroids, 1059; medicine, tendencies in, 1005; Münchmeyer's disease, 1239; new photographic method, 1464; pellagra, 1239; pregnancy, surgery during, 1059

ROYAL MEDICAL SOCIETY.—Changing conceptions of disease, 970

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—Dinner, 95; endocrinology and mental disorder, 93; general paralysis of insane, 94; hæmatology of psychoses, 93; presidential election, 566; psychiatry, four decades of, 93

ROYAL SANITARY ASSOCIATION OF SCOTLAND.—Presidential address, 739

ROYAL SOCIETY OF MEDICINE.—Sections of: Anæsthetics (A) 1069, 1362—Comparative medicine (A) 1307—Comparative pathology, 943—Epidemiology, 1001, 1176—Laryngology, 1349—Medicine, 946, 1237, 1328, 1351—Neurology, 335, 945—Obstet- [illegible] Ortho- [illegible] 1001 [illegible] 120— [illegible] and pharmacology, 1122, 1351—Tropical diseases and parasitology (A) 840, 1176, 1236

Subjects of discussion: Agranulocytosis, 1351; alastrim, 1236, (A) 1305; anæsthetics, teaching of (A) 1069; breech presentations, 941; chemotherapy (A) 840; common cold (A) 1307; cyclopropane anæsthesia (A) 1362; drugs with a camphor- and coramine-like action, 1122; electrotherapy 1910–35, 1001; epidemiology, biological approach to, 1001; malaria in Ceylon, 1176; myocardial deficiency, 946; nervous system, 945; obesity, 1237, 1328; obsessional *illness* (A) 1420; *orthopædic* surgery, development of, 770; paralytic ileus in acute appendicitis, 1120; psychiatric digressions, 827; sinusitis, frontal, 1349; viruses, clinically allied, 943

Address, 1130; Anæsthetics Committee, 1378; Hughlings Jackson lecture, 335; Lloyd Roberts lectures, 693, 783, 1130, 1236, (A) 1305; scholarship, 284

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—Pruritus, 287

SHEFFIELD MEDICO-CHIRURGICAL SOCIETY.—Traumatic epilepsy, 1217

SOCIETY FOR THE STUDY OF INEBRIETY.—692

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—Dinner, 1269; diphtherial paralysis, 80; fever hospitals (A) 1308; policy of the Society (A) 34; presidential address (LA) 949, (A) 1308

TUBERCULOSIS ASSOCIATION.—Industrialism and tuberculosis, 1295; meeting, 1036

ULSTER MEDICAL SOCIETY.—Vitamins, 1148

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—Dinner, 112

WOLVERHAMPTON AND DISTRICT CLINICAL CLUB.—Exophthalmic goitre, 1297

Society—politics and (LA) 1127; Primitive Society and its Vital Statistics (L. Krzywicki) 60
Society for Relief of Widows and Orphans [illegible]
[illegible] of London—[illegible] 230, 1270; [illegible] s, 230, 587, [illegible] y, 1036 [illegible] 92
Sodium chloride, suprarenal gland and (A) 33, (S. L. Simpson) (C) 106
Sodium salicylate, use of (LA) 619
Solomons, B., on carcinoma of uterus, 1058
Southwell, T., and Blacklock, D. B., Guide to Human Parasitology (R) 1416
Souttar, H. S., on after-effects of accidents, 1117
Soya Bean (E. Bowdidge) 1497
[illegible] see Bovine tuberculosis

pecialist treatment—British Medical Association and, 212 ; local authorities and (PI) 51 ; specialism, excessive (LA) 3101 ; ultra-violet treatment by laymen, 1144
pectacles, broken, insurance against, 1389
peculum, self-retaining vaginal (C. H. Rivers) (NI) 305
Spemann, H., Nobel prize (A) 1016
Spence, A. W., gonadotropic hormones for undescended testes, 1335, (LA) 1355
Spermatic cord, torsion of (G. F. Langley) 181
Spermicides (A) 779
Sphenoidal sinusitis, pituitary gland and, 1026
Spicer, W. T. H. (O) 400
Spiers, H. W., Modern Treatment of Fractures (R) 82
Spillane, J. D., tetanus in child, 249
Spinal—chordotomy for pain (A. S. B. Bankart) (C) 1432, (L. Rogers) (C) 1485 ; compression, hæmophilia and (W. M. Priest) 1289, (W. J. Rutherfurd) (C) 1378 ; meningitis, lipiodol in (G. Harrower) 715, (A. Piney) (C) 802 ; tumour, papillœdema and (D. McAlpine) 614
Spine—caries of (H. J. Seddon) 355 ; fractures of vertebral bodies, prognosis in (H. E. Griffiths) (P) 439
Spira, J. J., treatment of hæmatemesis (C) 1378
Spirochætosis icterohæmorrhagica, *see* Weil's disease
Spleen—Spleen and Resistance (D. Perla and J. Marmorston) (R) 1300 ; torsion of (Y. Cantin) 1175
Splenic artery—ligature of, for splenic anæmia (F. P. Connor) (C) 46
Spriggs, Sir E., headaches, 1, 63, (C) 344 ; on obesity, 1237
Sprue, liver therapy in (LA) 1127
Spurrier, A. H. (O) 163
Sputum, cancer cells in (A) 1247
Squint—Amblyopia Reader (M. Dobson) (LA) 378 ; London County Council training clinic for (M. Thornett-Johnson) 183
Stacey, R. S., calciferol in tetany, 656
Stacey-Cleminson, F. (O) 107
Stannus, H., kwashiorkor (C) 1207 ; on yaws and syphilis, 134
Staphylococcal—antitoxin for burns (F. Marsh) (C) 1088 ; *see also* Skin
Stark, W., work of (J. C. Drummond and A. Wilbraham) 459, (LA) 431
Steatorrhœa, idiopathic, duodenocolic fistula simulating (J. Mindline and M. L. Rosenheim) 764
Steel, J. P., cod-liver oil for wounds, 290
Stenhouse, A. B., paroxysmal tachycardia, acetylcholine in, 1291
Stephen, A., on nullity and impotence, 1233
Stercoraceous ulcer, perforation of (J. J. O'Reilly) 1175
Sterilisation of drug solutions (LA) 28
Sterilisation, eugenic—Case for Sterilisation (L. F. Whitney) 751 ; in Germany (A) 565 ; Sterilisation : A Christian Approach (J. P. Hinton and J. E. Calcutt) 751 ; Sterilisation ? Birth Control ? (H. Macmurchy) 751
Sterility—(A) 1246 ; lumbar sympathectomy and (A. F. Hurst) (C) 105
Sternal biopsy (A) 1306, 1352
Sternum, congenital defect of (A. Jordan) 877
Stevens, A. A., Manual of the Practice of Medicine (R) 136
Stevenson, E., cod-liver oil for burns (C) 1376
Stevenson, F. H., artificial pneumothorax in pleural pain, 1463
Stevenson, R. S., Recent Advances in Laryngology and Otology (R) 1298
Stewart, C. P., on fat content of blood, 1318
Stewart, J. A., presentation, 349
Stewart, W., septicæmia due to *B. fæcalis alkaligenes*, 718
Stickit doctor (N. G. Horner) 1039
Still, G. F., on infantile scurvy (LA) 431 ; on perspective in medicine (A) 896
Stillbirth, apparent, *see* Asphyxia neonatorum
Stocks, P., influenza epidemics, certified causes of death and, 386
Stokes, E. H., on obesity, 847
Stokes, J. H., on neurodermatoses (LA) 1063
Stomach—cancer of, radiography of, 1368 ; disease of, headaches and (Sir E. Spriggs) 1 ; Gastritis and its Consequences (K. Faber) (R) 306 ; gastroscopy (Traité de gastroscopie) (F. Moutier) (R) 82, (H. C. Edwards) 1161, (LA) 1244 ; pyloric carcinoma, achlorhydria in (J. A. Ryle) (C) 46 ; pyloric stenosis, congenital, prognosis in (G. Herzfeld and H. L. Wallace) (P) 385 ; stomach-holding forceps (T. J. D. Lane) (NI) 253
Stoneman, E. T., Halfway to the Hereafter (A) 87
Stothart, S. N. H., germicidal properties of mercury preparations (C) 917
Stott, A., on myocardial deficiency, 946
Stowell, T. E. A., on industrial medicine (LA) 378
Strabismus, *see* Squint
Strachan, G., on maternal mortality, 1255
Streptococcal infections — bacteriæmia after dental extractions (C. C. Okell and S. D. Elliott) 869 ; chemotherapy in (A) 840 ; in burns ward (LA) 834 ; of skin, prognosis in (H. W. Barber) (P) 35 ; *see also* Puerperal and Scarlet fever
Striæ atrophicæ of puberty (F. P. Weber) 885, 1347
Strong, E. C. N., infection of antrum, 131
Strophanthin therapy (A. Fraenkel) 1101
Stuart-Harris, C. H., hæmolytic streptococcal fibrinolysis, 1456 ; on hedgehogs and the common cold (A) 1307
Students, medical—American, abroad (A) 838 ; Elementary Zoology for Medical Students (L. A. Borradaile) (R) 772 ; Hungarian students' number of journal, 537 ; Rumanian, limitation of, 338 ; students' guide, 465 ; tuberculosis in, 61 ; Viennese, number of, 1085 ; *see also* Education, medical
Subarachnoid hæmorrhage (H. D. Pickles and A. H. Dunkerley) 1461
Subconscious, *see* Mind
Submaxillary gland, *see* Salivary glands
Subnormal Mind (C. Burt) (R) 617
Suckling, C. W. (O) 279
Suicide—alleged attempt, by starvation (ML) 395 ; attempted, self-performed enterectomy and (T. C. Astreos) 191 ; Halfway to the Hereafter (E. T. Stoneman) (A) 87 ; trunk-leg ratio and (A. Piney) (C) 972, (A. Abrahams) (C) 1031
Sullivan, A. J., Blumer, G., and Smith, D. P., Practitioner's Library of Medicine and Surgery : Vol. VIII. Therapeutics (R) 771
Sun-bathing—Sensible Sun Bathing (I. O. Evans) 172
Sunlight — Artificial Sunlight (M. Luckiesh) (A) 1189
Suprarenal gland—carcinoma of, basophilism and (D. C. Hare, J. M. Ross, and A. C. Crooke) 118, (LA) 775 ; sodium chloride and (A) 33, (S. L. Simpson) (C) 106
Surgery—Beesley and Johnston's Manual of Surgical Anatomy (J. Bruce and R. Walmsley) (R) 25 ; changes in (G. E. Gask) 982 ; French congress of, 917 ; International Society of Surgery, 1130 ; manipulative surgeon, use of word (ML) 1023, 1202, (LA) 1128 ; problems of, 917 ; right to operate, 409 ; surgical shock, 1412
Surgical Instrument Manufacturers' Association, 1095
Surgical spirit prescriptions (PCP) 689
Susman, M. P., on treatment of tuberculous empyema, 1028
Susman, W. J., foreign body in tonsil (C) 584
Sutcliffe, W. G., on Margate as health resort, 791
Suttie, I. D. (O) 1035
Sutton, H., on social aims of mental hygiene, 965
Swan, W. G. A., Weil's disease in coal-miners, 570
Swartz, J. H., and Reilly, M. G., Diagnosis and Treatment of Skin Diseases (R) 889
Sweden, dental clinics in, 1148
Sweepstakes—Irish Hospitals, 395, 1029 ; medical research and, 1318
Swimming, *see* Channel swimmers
Swimming baths—purification of, 1095 ; scarlet fever and, 740, (J. C. Sleigh) (C) 803
Swiss medical year-book, 646
Swyer, R., diphtheria formol toxoid and Moloney test, 22
Symonds, C. P., traumatic epilepsy, 1217
Sympathectomy—arterial obstruction in leg treated by (G. Williams) 1020 ; Autonomic Nervous System (J. C. White) (R) 1182 ; Clinical Aspects of Visceral Neurology (W. K. Livingston) (R) 24 ; lumbar, sterility and psychoneuroses following (A. F. Hurst) (C) 105 ; value of (LA) 1011
Synge, V. M., on tendencies in medicine, 1005
Syphilis—aortic (A) 381, 839 ; balanitis and (A) 727 ; Fracastor : Syphilis or the French Disease (H. Wynne-Finch and J. J. Abraham) (A) 89 ; International Congress of Dermatology and Syphilology (A) 436, 1078, (LA) 1243 ; marriage and (A) 624 ; Morbus Gallicus ([illegible] F. Fulton) ([illegible] in, aplastic [illegible] H. Imrie) 73 ; pregnancy and (A) 677 ; *see also* General paralysis of insane, Tabes dorsalis, and Venereal disease

T

Tabes dorsalis, lightning pains of, 910
T.A.B. vaccine, *see* Pyrotherapy
Tait, J., on urinary antiseptics, 1076
Tanner, N. C., congenital malaria, 369
Tarneaud, J., Le Nodule de la Corde Vocale (LA) 27
Tattersall, C. H. (O) 1208
Taylor, H., appendicitis in aged, 937
Taylor, J., obstruction in common bile-duct, 1140
Tecon, R. M., proctalgia fugax (C) 455
Teeth—antral infection and (E. C. N. Strong and I. B. Barclay) 131 ; Commonsense Dentistry (E. Samson) (R) 137 ; dental clinics in Sweden, 1148 ; Ivory Cross National Dental Aid Fund, 1309 ; malocclusion of, prognosis of (A. T. Pitts) (P) 567 ; septic, bacteriæmia and (C. C. Okell and S. D. Elliott) 869
Temperature, shivering and (A) 381
Teratomata, formation of (Sir W. Langdon-Brown) 1155
Testis—cancer of, prognosis in (K. M. Walker) (P) 1424 ; ectopic, pressure on ureter by, 114 ; orchidectomy on the high seas (P. E. F. Frossard) 1409 ; torsion of (G. F. Langley) 181 ; undescended, treatment of (E. D. McCrea) 753, (A. W. Spence and E. F. Scowen) 1335, (LA) 1355, (D. Browne) (C) 1484
Tetanus—appendix operation and (ML) 577 ; avertin in (L. Cole) 246, (LA) 256, 957 ; curare in (LA) 256 ; immunisation against (A) 625, 687 ; in young child, serum for (J. D. Spillane) 249 ; prognosis of (L. Cole) (P) 957 ; toxin of, action of (A) 317
Tetany, calciferol in (R. S. Stacey) 656
Thaysen, Th. E. H., proctalgia fugax, 243
Therapeutics—Introduction to General Therapeutics (H. K. Fry) (R) 1182 ; Practitioner's Library of Medicine and Surgery : Vol. VIII. Therapeutics (G. P. Blumer, D. P. Smith, and A. J. Sullivan) (R) 771 ; Year Book of General Therapeutics (B. Fantus) (R) 1241 ; *see also* Drugs and Pharmacology
Thesing, C., School of Biology (A) 144
Thomas, H. O., commemoration portrait of, 641
Thomson, D. L., water and fat metabolism, liver function and, 297
Thomson, H. C., Story of Middlesex Hospital Medical School (R) 251
Thomson, H. H., and Hutt, C. W., Principles and Practice of Preventive Medicine (R) 557
Thomson, Sir S., on ciliary action (A) 1066
Thoracic, *see* Lung and Tuberculosis, pulmonary
Thornett-Johnson, M., squint training clinic, 183
Throat—burns infected from (LA) 834 ; clinics, American (M. Ellis) 643 ; direct inspection of (N. Patterson) 1019 ; epidemic of sore-throat, diphtheria and, 740, (J. O. Hollick) (C) 860, (S. R. Bhat) (C) 1377 ; foreign bodies in (V. E. Negus) (P) 730 ; hypopharyngeal cancer, combined distance radiation of (S. Cade and F. M. Allchin) 652, (A) 675 ; puerperal sepsis and (P. M. Congdon) 1287, (LA) 1302, 1433 ; scarlet fever immunisation and infection of (W. R. F. Collis) (C) 859

Thrombo-angiitis obliterans (J. B. McDougall and J. H. Crawford) 366, (O. Leyton) (C) 456

Thrombosis—aortic (J. Gough) 21 ; coronary, 1004 ; of pampiniform plexus (D. McGavin) 368 ; post-operative intracranial (P. R. Evans) 12

Thymus gland, Cushing's syndrome and (LA) 775

Thyroid gland—Diseases of the Thyroid Gland (A. E. Hertzler and V. E. Chesley) (R) 772 ; exophthalmos and (Sir T. Oliver) 1116 ; lateral aberrant thyroids (A. L. d'Abreu) 1406 ; obesity and (J. H. Anderson) 604, 846 ; thyroidectomy, tetany and, 656 ; thyrotoxicosis, 786, causes of, 1297

Tibbles, S., quinine amblyopia (C) 1089

Tidy, H. L., hæmatemesis, surgery and (C) 915, 1030 ; and Short, A. R., Medical Annual, 1935 (R) 558

Tissue extracts in treatment of cancer (H. S. Baker) (C) 583

[illegible] 458 [illegible] (E. Gwynne-Evans) [illegible] body in (W. J. Susman) (C) 584 ; peritonsillar abscess opener (A. Miller) (NI) 1123 ; removal of, value of (A) 727 ; Tonsils and Nasopharyngeal Sepsis (E. A. Peters) (R) 1354 ; *see also* Throat

Tonus, depression of (Y. Henderson) 178

Topley, W. W. C., on herd immunity (LA) 141

Torres, C. M., on pathology of alastrim, 1236, (A) 1305

Torticollis, 1257

Tour, medical, 1095

Toxæmias, *see* Anaerobic toxæmias, Eclampsia, and Pregnancy

Trachea, foreign bodies in (V. E. Negus) (P) 731

Trachoma, League of Nation's report on (LA) 434

Traquair, H. M., on glaucoma, 1139

[illegible] and (A) [illegible]

Trent, Lord, on industrial medicine (LA) 378

Trichomonas infection, *see* Vaginitis

[illegible] Bayly) (R) 558 [illegible] ical Parasitology (D. de Rivas and C. T. de Rivas) (R) 1466 ; Heart Disease in the Tropics (H. O. Gunewardene) (R) 375 ; incidence of disease in tropics, 902 ; lectures on, 1149 ; Manson's Tropical Diseases (P. H. Manson-Bahr) (R) 1353 ; progress in, 901 ; Tropical Diseases Bulletin, 1200

Trotter, W., triple structure of medicine, 783

Troup, G. A., appointment, 747

Troup, W. A., tuberculosis of nasal sinuses treated by irradiation, 667

Trunk-leg ratio (A. Piney) (C) 972, (A. Abrahams) (C) 1031

Tr [illegible] f (A) 437 ; [illegible] ; trypano- [illegible] strains of [illegible]

Tuberculosis—abdominal, latent (LA) 310 ; clinic in East Ham, 808 ; Clinical Tuberculosis (B. Goldberg) (R) 1124 ; in children, nation's responsibility and, 37, (LA) 29 ; in France, 337, 735, 1369 ; in Iceland (LA) 1129 ; in Italy (A) 1361 ; in medical students, 61 ; international union against, 284 ; in Wales (PCP) 689 ; Joint Tuberculosis Council, 1329 ; notification of (PCP) 803 ; of intestine, perforation and (D. B. Rosenthal) 882 ; of larynx, ultra-violet therapy in, 1026 ; of nasal sinuses, irradiation in (W. A. Troup) 667 ; of skin, 1265, prognosis in (H. C. Semon) (P) 1474 ; of spine (H. J. Seddon) 355 ; post-graduate course on, 864 ; research on, 349, 1148 ; primary and later manifestations of, interval between (A) 1421 ; rheumatoid arthritis and (W. S. C. Copeman and R. D. Clay) 1460 ; sea-bathing for, 1026 ; Tuberculosis of the Lymphatic System (R. H. Miller) (R) 1184 ; tuberculous meningitis (LA) 950 ; *see also* Bovine tuberculosis, Sanatorium, and—

Tuberculosis, pulmonary—Clinical Tuberculosis (B. Goldberg) (R) 1124 ; cough of, humidity and (G. C. Pether) (C) 971 ; empyema and, 1028 ; gold treatment in, 8, (B. A. Peters and C. Short) 11, (C) 157, (LA) 85, (C. Shaw) (C) 105 ; industry and, 1295 ; intestinal perforation and (D. B. Rosenthal) 882 ; medical treatment of (W. E. Lloyd) 852, 1179 ; mortality from, influenza and (P. Stocks) 386, (D. Leys) (C) 581 ; osteo-arthropathy and (A) 895 ; pregnancy and [illegible] and [illegible] (R) [illegible]

Tuberculosis, pulmonary, surgery of—(Tudor Edwards) 853, (LA) 891, 1179 ; bilateral collapse, death following (H. Batty Shaw) (C) 155 ; Chirurgie de la tuberculose pulmonaire (A. Bernou and H. Fruchaud) (R) 1007 ; Clinical Tuberculosis (B. Goldberg) (R) 1124 ; endoscopy and [illegible] et pleurolyse) [illegible] in Scandinavi[illegible] to (Introduction à la chirurgie thoracique) (E. E. Lauwers) (R) 1184 ; kymography and (LA) 432 ; new collapse operation (A) 1131 ; phrenic nerve operations (H. M. Davies) 418 ; pleural effusion and, 1027 ; pleural shock, air embolism and (LA) 1417 ; pneumolysis, internal (F. G. Chandler) 879, (LA) 891 ; pneumothorax needle (A. Morland) (NI) 253

Tucker, W. E., fractures of calcaneus (C) 46 ; Injuries and their Treatment (R) 23

Tumarkin, A., vasomotor rhinorrhœa, 826

Turner, G. Grey, on paralytic ileus, 1121

Turner, P., on paralytic ileus, 1121

Twining, E. W., on bone absorption, 1257 ; on gastro-intestinal neoplasms, 1368 ; ventriculography by opaque injection, 122

Twort, C. C., and Twort, J. M., induction of cancer by cracked mineral oils, 1226, (A) 1249

Twort d'Hérelle, phenomenon of (E. Wollman) 1312

Typhoid fever, *see* Enteric fever

Typhus fever, doubtful case of, 864

U

Ultra-violet radiation—Essentials of Light Treatment for use of Masseuses (E. M. Anderson) 1446 ; measurement of (J. S. Owens) 589 ; of laryngeal tuberculosis, 1026 ; of tuberculous sinusitis (W. A. Troup) 667

Unconscious, see Mind

Undulant fever—(Sir W. Dalrymple-Champneys) 1449 ; in France, 1369 ; protein shock in (G. E. Beaumont and A. P. M. Page) 940, (S. Miller) (C) 1030

Unemployment—children's allowance (PI) 979, 1032, public assistance and (PI) 1383 ; meals for necessitous juveniles (PI) 111 ; neurosis and (A. Lewis) 293, (LA) 311, (H. A. Palmer) (C) 455 ; regulations, inquiry into (PI) 979, 1383 ; *see also* Insurance, National Health, and School-children

United States of America—Blindness and the Blind in the United States (H. Best) (A) 1305 ; Commonwealth Fund (A) 145 ; crime in, prevention of, 1082 ; group practice in (PCP) 1086 ; infant mortality in nineteenth century (A) 726 ; maternity hospitals in (K. V. Bailey) 12[illegible] (A) 838 ; [illegible] American [illegible] detection of defects in (LA) 13[illegible]

UNITED STATES OF AMERICA, CORRESPONDENCE FROM.—*Abortion*, 1429—American Public Health Association, 1081—Amœbic dysentery, water-borne, 451—Bather's itch, 451—Heart disease, 1429—Public health, financial aid for, 154—*Vitamin B*, *new source of*, 1429—Water pollution, 1369

[illegible] oun- [illegible] dical [illegible] (C) [illegible] 1484 ; training at, purpose of (Sir W. Moberly) 855

UNIVERSITIES. — Aberdeen : appointment, 808 ; degrees, 167 ; diplomas, [illegible] l school, jubilee [illegible]—Birmingham : [illegible] lectures, 411, (A) 438 ; opening address, 911 ; post-graduate lectures, 587, 808, 1095 ; William Withering lectures, 697, 758—Bristol : degrees, 348, 1388 ; lecture, 808 ; pass li[illegible] tercentenary, 1[illegible] dress, 1134 ; [illegible] 1329 ; degrees, [illegible] 1094, 1209, 1329, [illegible] fellow, 980 ; p[illegible] regius professor of physic, 641, 694, 1134, inaugural lecture (LA) 1301 ; scholarships, 348, 1036 ; studentships, 348—Dublin : degree, 980 ; pass lists, 168, 921, 1388 ; post-graduate course, 458 ; Purser memorial lecture, 647—Durham : appointments, 168, 1473 ; degrees, 57 ; diplomas, 57 ; medical college, 747, 1070 ; University of Durham Act (PI) 53, 345—Edinburgh : degrees, 57, 230 ; diplomas, 230 ; election, 1084 ; grant, 1084 ; medical curriculum, 1029 ; prizes, 230—Egyptian University, Cairo : appointment, 169—Glasgow : appointments, 57, 587, 980 ; degrees, 57, 980, 1094 ; prizes, 980—Hong-Kong : appointment, 284—Leeds : medal, 808 ; pass list, 808 ; prize, 808—Liverpool : *appointment*, 641 ; diplomas, 864 ; emeritus professor, 1148 ; lectures, 1070, (LA) 1468 ; pass lists, 111, 1492—London : appointments, 230, 1036, 1148, 1269, 1388, 1493 ; Bayliss-Starling scholarship, 111 ; degrees, 282, 1036, 1493 ; emeritus professor, 1036 ; fellowships, 167 ; lectures, 808, 864, 1148 ; medal, 348 ; pass lists, 111, 167, 348, 1443, 1493 ; prizes, 111, 167, 921 ; Semon lecture, 1066 ; studentship, 348—Manchester : appointments, 169, 282 ; *grant*, 169 ; *pass lists*, 111, 1443—Melbourne : degrees, 785—National University of Ireland : appointments, 168 ; degree, 1388 ; pass lists, 168, [illegible] 1037—Oxford : [illegible] degrees, 230, [illegible] donation, 170 ; election, 282 ; pass list, 57 ; Schorstein research fellowship, 1269—Queen's University, Belfast : degrees, 168 ; pass list, 168—Reading : degrees, 1036—St. Andrews : appointments, 168, 1094 ; degree, 57—Sheffield : appointments, 168, 921, 1148, 1443 ; emeritus professors, 921 ; grant, 1443 ; pass lists, 111, 1492 ; resignation, 1443—Wales : pass list, 921

University College Hospital Medical School—fellowship, 283 ; lectures, 959, 1019, 1140, 1155, 1492

Unregistered practitioners—(LA) 1186 ; abortion, naturopath and (ML) 1438 ; diabetes treatment by (ML) 630 ; [illegible] tion [illegible] ical [illegible] (C) [illegible] E. [illegible] venereal disease treated by (ML) 1146, 1317

Upcott, H., on surgery of pancreas, 845

[illegible] vall) 940 ; [illegible] f (I. B. [illegible] ; ectopic testis and, 114

Urethra—bougie and catheter, combined (M. Paul) (NI) 556 ; ruptured (H. C. Hopkinson) 428

Urinary—fistula, appendicectomy and (V. Riddell) (C) 971 ; tract, congenital abnormalities of (I. B. Barclay and J. B. Baird) 1169 ; *see also*—

Urin[illegible] 076 ; in [illegible] f the Ur[illegible] (R) 721 ; in new-born (A) 1306 ; mandelic acid in (M. L. Rosenheim) (C) 741 ; puerperal sepsis and, 1138 ; symposium on (A) 1067 ; treatment of, 127, (LA) 140

Urine—anuria, spinal anæsthesia for (D. S. Hayes and R. H. Paramore) 554 ; hæmaturia, vitamin C in, 1285 ; hæmoglobinuria, quinine therapy and, 554 ; phenylpyruvic acid in, amentia and (L. S. Penrose) 192 ; *see also* Urinary infections and Vitamin C

Urology—Principles and Practice of Urology (F. Hinman) (R) 136 ; Urology in General Practice (A. E. Roche) (R) 771

Uterus—cancer of, 1058, 1083, 1464 ; fibroids, prognosis in (V. Bonney) (P) 626 ; fibroids, removal of, 1059 ; infections of, phenylmercuric nitrate in (L. H. Biskind) 1049 ; infections of, puerperal sepsis and, 1138 ; inversion of (J. Cook) 884, (C. J. C. Cooke) (C) 971

V

Vacancies, weekly lists of, 62, 113, 170, 231, 286, 354, 407, 458, 538, 592, 642, 696, 748, 810, 868, 924, 981, 1038, 1098, 1154, 1216, 1274, 1334, 1392, 1444, 1498
Vaccination—early, dangers of (D. Paterson) (C) 691, (A. Goodwin) (C) 744 ; encephalitis and (E. W. Hurst) 758, (PI) 1442 ; in Germany, 114 ; problem of, 1099 ; *see also* Small-pox
Vaginal—speculum, self-retaining (C. H. Rivers) (NI) 305
Vaginitis—diagnosis and treatment of (A) 1070 ; phenylmercuric nitrate in (L. H. Biskind) 1049 ; trichomonas (LA) 1417
Variability of man (LA) 1356
Variola, *see* Small-pox
Vascular, *see* Circulation
Vasoconstrictor principle in skin of frog, 1076
Vaughan, K., on pet chimpanzee, 232, 410
Vaus, P. N., Anatomy of Leg and Foot, 61
Veins, *see* Circulation and Thrombosis
Venereal disease—extinction of, 1078, (LA) 1243, (D. White) (C) 1375, (C. Rolleston) (C) 1485, (C) 1485 ; *treatment of*, 134, 1078, by unregistered practitioner (ML) 1146, 1317 ; *see also* Gonococcal and Syphilis
Ventilation—gas heating of flueless rooms, 398
Ventriculography, 1368, by opaque injection (E. W. Twining and G. F. Rowbotham) 122
Vertebral, *see* Spine
Veterinary, *see* Animals
Vickers, A., on Australian aerial medical service, 964
Victor Horsley lecture, 458

VIENNA, CORRESPONDENCE FROM.—Birth-rate and infant mortality, 396—Health insurance, 215—Marriage and progeny, 1085—Medical curriculum, 396—Paul, G., death of, 1085—Students, medical, numbers of, 1085

Vilvandré, G. E., X ray treatment, 1265
Vint, F. W., malignant disease in natives of Kenya, 628
Viper venom in hæmophilia (LA) 893
Viruses—agglutination of virus bodies (J. C. G. Ledingham) (C) 45, (M. H. Gordon) (C) 104 ; alastrim and small-pox, 1236, (A) 1305 ; bovine pleuro-pneumonia (LA) 1064 ; cancer (A) 1249 ; common cold (A) 1307 ; inapparent virus infections, 963 ; influenza (LA) 27 ; lymphadenoma, 874, (A) 895 ; neurotropic (E. W. Hurst) 697, 758 ; pock diseases, 943 ; psittacosis (S. P. Bedson) 1277 ; research on (Sir H. Dale) 927 ; rheumatic effusions, virus bodies in (A. C. Coles) 125, (F. J. Poynton) (C) 218 ; skin affections due to, 1079
Visceral—Clinical Aspects of Visceral Neurology (W. K. Livingston) (R) 24 ; sensibility (S. Wright) 794
Vision—colour (A) 203 ; defective, headaches and (Sir E. Spriggs) 1, 63 ; myopia (LA) 1418 ; *pituitary tumours* and (H. Cairns) (P) 1310, 1363 ; sight-testing by opticians, 209 ; *see also* Blind and Squint
Vital statistics—certified causes of death, influenza epidemics and (P. Stocks) 386 ; chief medical officer's report, 913 ; death-rate in depressed areas (A) 1248 ; in Austria, 396 ; in Iceland (LA) 1129 ; in Ireland, 792 ; Statistical Review of England and Wales, 1934, 1034 ; young adults, mortality of, accidents and (A) 674 ; *see also* Infant mortality and Maternal mortality
Vitamin A—deficiency, nerve lesions and (A) 313 ; standardisation and estimation of (A) 1307
Vitamin B—deficiency, sprue, pernicious anæmia and (LA) 1127 ; new source of, 1429 ; *see also* Beri-beri and Pellagra
Vitamin C—ascorbic acid and (LA) 431, (A) 624 ; in hæmorrhagic disorders (H. Engelkes) 1285 ; rheumatic heart disease and (C. B. Perry) 426, (LA) 431 ; sources of (A) 1470 ; subnutrition, urine analysis in, 426, (LA) 431, (M. A. Abbasy, L. J. Harris, S. N. Ray, and J. R. Marrack) 1399, (P. Wood) 1405 ; *see also* Scurvy
Vitamin D—sources of, potency of, 448
Vitamins—Application of Absorption Spectra to the Study of Vitamins and Hormones (R. A. Morton) (A) 897 ; chemistry of (Sir H. Dale) 927 ; *in* habitual abortion, 1464 ; skin and, 1079 ; standards for (A) 143
Vocal cord—singer's nodule (Le Nodule de la Corde Vocale) (J. Tarneaud) (LA) 27
Volatile solvents, toxic action of, 263, (A) 675

W

Waddington, C. H., How Animals Develop (R) 1241
Wainwright, D., on bone and joint infections, 1119
Wakeley, C. P. G., on gall-stone obstruction of intestine, 1153 ; stabilisation of
. 708
207, (A) 955 ;
50 ; public
age and (LA)
835 ; tuberculosis in (PCP) 689
Walker, A. B., *on blood pressure* (LA) 1356
Walker, G. A., ("Graveyard") work of, 285
Walker, G. F., chorea, 553
Walker, H., death of, 384, (O) 453
Walker, J., leopard bite, 133
Walker, K., Sex (R) 1353
Walker, K. M., prognosis in cancer of testis (P) 1424
Walker, M. B., potassium chloride in myasthenia gravis (C) 47 ; prize, 34
Walker, O., useful adapter, 926
Walker, R. M., undescended ovaries, 1346
Wallace, H. L., prognosis in congenital stenosis of pylorus (P) 385
properties of
1031
ice in London
(C) 1430
Waller, R. G., control of whooping-cough, 361, (LA) 377, (C) 635
Walmsley, R., and Bruce, J., Beesley and Johnston's Manual of Surgical Anatomy (R) 25
Walsh, C. H., on chorio-angio-fibroma, 1296
Walshe, F. M. R., on diphtherial paralysis, 81
Wand, S., on public medical services, 1479
War—injuries to face and jaw (A) 144 ; mentality, 265, 907, (J. H. Moynihan) (C) 1031 ; nervous disorder and (LA) 311
Warbasse, J. P., The Doctor and the Public (R) 722
Ward, J. H., myeloblastic leukæmia, 1292
Warden, H. F. W., epigastric hernia (C) 637
Wardill, W. E. M., cleft palate (C) 47
Wards, *see* Hospitals
Warner, E. C., on agranulocytosis, 1352
Warts, plantar (A) 435
Warwick, T., colostomy, 298 ; gastro-colic fistula (C) 1432
Washburn, B. E., on venereal disease, 135
Water metabolism, liver function and (H. Selye, J. B. Collip, and D. L. Thomson) 297
Water-supplies—London water, 1080 ; national and local, 102 ; purification of, ozone for, 1374 ; rural (PI) 280, 1442 ; *see also* Sewage
Watkins, A. E., Heredity and Evolution (R) 1354
Watson, Sir M., on malaria and hookworm (A) 382
Watts, W. W., on world's surface (LA) 620
Wauchope, G. M., persistent high blood pressure (C) 404 ; and Hutchison, R., For and Against Doctors (A) 1191, 1216
Webb-Johnson, A. E., tribute to, 57
Weber, F. P., on carcinoma telangiectaticum (A) 1013 ; striæ atrophicæ of puberty, 885, 1347
Wechsler, D., Range of Human Capacities (LA) 1356
Wechsler, I. S., Textbook of Clinical Neurology (R) 1300
Weil's disease—in coal-miners (W. G. A. Swan and J. A. McKeon) 570 ; in Queensland, 903 ; in sewer-worker (J. Maxwell) 998 ; organism of, in rat from coal-pit (H. A. Cookson) 192 ; stream infection and (A. V. Neale) 999
Weinstein, L., Rettger, L. F., Levy, M. N., and Weiss, J. E., Lactobacillus Acidophilus (R) 721
Weiss, J. E., Rettger, L. F., Levy, M. N., and Weinstein, L., Lactobacillus Acidophilus (R) 721
Weissenberg, E., and Holzer, W., Grundriss der Kurzwellentherapie (R) 1125
Wells, A. F., Local Social Survey in *Great Britain*, 1100
Wellstood, F. C., Dr. John Hall, 1332
Welsh National School of Medicine—641 ; address, 747, 1043 ; appointment, 169
Westminster Hospital Medical School—dinner, 406 ; opening address, 799 ; post
West
duates
of tl
980
Whitb
fever,
251 ; and Britton, C. J. C., Disorders of the Blood (R) 669
White, D., regulation of prostitution (C) 1375
White, E. W. (O) 1320
White, F. W., Birth Control and its Opponents, 1447
White, J. C., Autonomic Nervous System (R) 1182
White, P. D., chronic constrictive pericarditis, 539, 597, (LA) 621
White, W. A., and Jelliffe, S. E., Diseases of the Nervous System (R) 1183
White, W. H., Complete Physics (R) 948
Whitehouse, H. Beckwith, Eden and Lockyer's Gynæcology (R) 23
Whitfield, A., origin of boils (C) 916
Whitfield, F. G. S., and Wood, A. H., Introduction to Comparative Zoology (R) 430
Whitney, L. F., The Case for Sterilisation, 751
Whittaker, C. R., Anatomy : The Thorax (R) 26
Whooping-cough — bacteriological diagnosis of, 250 ; blood counts in (N. D. Begg and M. F. Coveney) 1113 ; in United States, 1081 ; mortality from, influenza and (P. Stocks) 386, (LA) 377, (D. Leys) (C) 581 ; ribs fractured in (W. Edgecombe) 374 ; specific control of, skin tests and (D. Paterson, R. H. Bailey, and R. G. Waller) 361, (LA) 377, (C) 1207, (B. McArdle) (C) 454, (R. G. Waller) (C) 635
Who's Who for 1936, 1423
Why Marry ? (S. Neville-Rolfe) (R) 1008
Wife *v.* Husband in the Courts (C. Mullins) (A) 622
Wig, K. L., on juvenile rheumatism in India (A) 146
Wigglesworth, V. B., on malaria in Ceylon, 1176
Wijerama, E. M., death following injection of atebrin mussonate, 1056
Wilbraham, A., William Stark, 459
Wilkinson, K. D., rheumatism, 411, (A) 438, (C) 691
Willcocks, G. C., on hypnotics (LA) 1188
Willcox, Sir W., on agranulocytosis, 1351 ; on hypnotics, 1074
Williams, C. D., kwashiorkor, 1151
Williams, D. L., presentation, 349
Williams, F. H., Radium Treatment (R) 1240
Williams, G., arterial obstruction in leg, 1020
Williams, J. G., Hygiene and Sanitation, 61
Williams, John Whitridge (A) 1421
Williams, L., hormone therapy in gynæcology, 794
Willoughby, W. G., on alcohol and road accidents, 207, (A) 259
Wills, A., death of, 985
Willway, F. W., on gall-stone *obstruction* of intestine, 1153
Wilshire, F. A., and Davis, O. C. M., Mentality and the Criminal Law (R) 1353
Wilson, A. M., on placenta prævia, 790
Wiltshire, J., ant-sting in nose (C) 344
Windeyer, J. C., on placenta prævia, 790

Winter, W. A. (O) 1096
Witness, *see* Evidence, medical
W[illegible]
W[illegible]
Wollman, E., phenomenon of Twort d'Hérelle, 1312
Women—Dufferin Fund Jubilee Report (A) 142; medical, married, employment of (A) 146; ministry of (LA) 1357; Women over Forty (S. Trent) 172
Wood, A. H., and Whitfield, F. G. S., Introduction to Comparative Zoology (R) 430
Wood, A. J., on pink disease, 1196
Wood, I., on pink disease, 1196
Wood, Sir K., physician as man of the world, 854
Wood, P., adult scurvy, 1405
Woodruff, H. A., on anaerobic toxæmias of animals, 963
Woods, R. S., adhesive strapping and the patch test (C) 580
Woodwark, Sir S., Manual of Medicine (R) 721
Wooldridge, G. H., Encyclopedia of Veterinary Medicine, Surgery and Obstetrics (R) 376
Worcester, A., Care of the Aged, the Dying and the Dead (R) 430
Workmen's compensation—miners' nystagmus, 265, departmental committee and (PI) 53, 347, 1032; *see also* Industrial medicine, Injuries, and Referees, medical
World's surface (LA) 620
Worster-Drought, C., agranulocytosis, 933; prognosis in cerebro-spinal fever (P) 841
Worth, R., on four decades of psychiatry, 93
Wounds, cod-liver oil for (J. P. Steel) 290, (E. Stevenson) (C) 1376
Wright, A. D., adhesive strapping and patch test (C) 580
Wright, H. W. S., hæmatemesis, surgery and (C) 973
Wright, R. E., on glaucoma, 1139
Wright, S., visceral sensibility, 794
Wrigley, A. J., forceps operation, 702, (LA) 725
Wrigley, C. H., on malignant cells in sputum (A) 1247
Wyard, S., and Piney, A., Clinical Atlas of Blood Diseases (R) 832
Wybauw, R., on health resorts, 974
Wyllie, A. M., aspirin poisoning, 768
Wyllie, W. G., and Pearson, W. J., Recent Advances in Diseases of Children (R) 720
Wynn-Jones, Ll., on personality and age (LA) 673
Wynne-Finch, H., Fracastor: Syphilis or the French Disease (A) 89

X

X rays—combined distance radiation of hypopharyngeal cancer (S. Cade and F. M. Allchin) 652, (A) 675; dangers of, 1153; treatment by (G. E. Vilvandré) 1265; victims of, 1154; *see also* Cancer, Cancer of, Radiography and Radiology

Y

Yaws, syphilis and, 134
Yearsley, M., Account of the Deaths of the Rulers of England (A) 1471
Yellow fever, aircraft and (A) 380
Young, G. (O) 1147
Young, J., on maternal mortality, 96

Z

Zammit, Sir T. (O) 1096
Zilva, S. S., on ascorbic acid (A) 624, (LA) 431
Zoethout, W. D., Textbook of Physiology (R) 1298
Zondek, B., Hormone des Ovariums und des Hypophysenvorderlappens (R) 1240
Zondek, H., Diseases of the Endocrine Glands (R) 135
[illegible] lical [illegible] 772; [illegible] logy [illegible] (R) 430
Zoster, *see* Herpes

CONCORDANCE

To enable the reader to determine at a glance the date and serial number of the issue of THE LANCET containing the required page reference.

Pages.	Date of Issue.	No.	Pages.	Date of Issue.	No.	Pages.	Date of Issue.	No.
1–62	July 6th	5836	539–592	Sept. 7th	5845	987–1042	Nov. 2nd	5853
63–114	,, 13th	5837	593–646	,, 14th	5846	1043–1100	,, 9th	5854
115–172	,, 20th	5838	647–696	,, 21st	5847	1101–1154	,, 16th	5855
173–232	,, 27th	5839	697–752	,, 28th	5848	1155–1216	,, 23rd	5856
233–286	Aug. 3rd	5840	753–810	Oct. 5th	5849	1217–1274	,, 30th	5857
287–354	,, 10th	5841	811–868	,, 12th	5850	1275–1334	Dec. 7th	5858
355–410	,, 17th	5842	869–926	,, 19th	5851	1335–1392	,, 14th	5859
411–464	,, 24th	5843	927–986	,, 26th	5852	1393–1448	,, 21st	5860
465–538	,, 31st	5844				1449–1498	,, 28th	5861

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ADDRESSES AND ORIGINAL ARTICLES

A CLINICAL STUDY OF HEADACHES *

BY SIR EDMUND SPRIGGS, K.C.V.O., M.D.,
F.R.C.P. Lond.
SENIOR PHYSICIAN, RUTHIN CASTLE

IN the early days of our lives as doctors we form impressions which lead us to become sceptical or sanguine about different cases. Our desire and hope is to do good to the patient, and, as he unfolds his story, there arises in the mind of the listener an estimate, built on heaped-up experience, of how far and in what way that hope can be fulfilled. When I was a student, there were a good many physicians who were by habit sceptical of the benefits of treatment generally. I was never one of them, but confess, as we all must, that there were certain groups of cases, which now can often be relieved, whose treatment was undertaken without much expectation of benefit. Among these were the sufferers from habitual headache. So many headaches were regarded as chronic, recurrent, familial, or due to the nervous make-up of the subject, that they seemed to be evils to be borne, with such alleviation as a few simple medicines could afford, rather than a field for active inquiry and treatment.

It is usual and convenient in teaching or speaking of systematic medicine to treat of diseases. But in practice one is confronted with symptoms. Headache is a symptom. It may arise from many different causes and is a frequent complaint in all branches of medical work. The sum total of its effects must be enormous, in pain, in limiting the power of the sufferers, in the shirking of issues and the loss of pleasures. The depressing and limiting effects upon those around are also great. Sometimes a headache is so intense that it fills the whole field, is, indeed, the disease. Often it is, though distressing, more bearable, and at other times it appears to call for or receive little attention. It cannot be admitted that symptoms, or other phenomena, vary in import with their intensity; and the minor and transient headaches have on occasion their significance. But I am not now considering them.

It may seem rash, and of little use, for one who is not a neurologist to enter this field of inquiry. But the neurological causes of headache, though important, are few; whereas headaches are very common, both among sick folk and among great numbers who are in moderate health. Still bolder is it to write or speak of a subject which has been so well and thoroughly dealt with by observers of unusual care and discernment from ancient times down to the present. The grounds on which the following series of patients complaining of headache is discussed are: First, that, in addition to an unhurried clinical examination, opportunity was afforded of applying such scientific tests as were indicated. Secondly, the mode of life, diet and medicines were under individual care in a great number of the cases for weeks or months, so that the result of treatment could be tested in favourable circumstances. Thirdly, all the patients were observed and treated by the same group of physicians. Fourthly, an attempt is made at the numerical estimation of varieties. Fifthly, it has been possible, in a good proportion, to find out the after-history and present state.

In the ten years from January, 1925, to January, 1935, 4796 patients were admitted to Ruthin Castle. I am much indebted to Dr. Mary Watson, who read all the records and put aside those in which there was complaint of headache, in number 570. About 70 were cases of minor or infrequent headaches the notes of which give no data definite enough to be worth including in this analysis. It is to the remaining 500 cases that I propose to direct attention. The population, in the statistical sense, from which these figures were taken was composed mostly of adults from the class of business or professional men and women and their families, with a proportion of what are known as leisured folk. Many of them had been subject to the anxiety and stress, financial and other, which has been borne since the war by those in responsible positions, as well as by the whole community.

The general nature of the diseases for which these patients sought relief is shown in the following summary of an analysis of 7100 consecutive cases made some time ago by Dr. Mary Watson and Mr. A. J. Leigh, B.Sc.

> One-third of the whole—namely, 2365 cases—were the subjects of disease or disorder of the heart, arteries, and veins. One-third suffered from diseases of the throat, œsophagus, stomach, and duodenum. With diseases of the pancreas, liver, gall-bladder, appendix, colon, and rectum added, just over a half were admitted for complaints of the alimentary canal and its accessory viscera. Other large groups were in the following order: arthritis and rheumatic diseases 670 cases, nervous diseases 558 cases; next, in order of numbers, affections of the lungs, diabetes, over- or under-nutrition, affections of ductless glands, kidneys, blood, skin, excess of alcohol, tobacco and other drugs, affections of throat and nose, prostate, womb and ovaries, bladder, and eyes. Then comes a long list of diseases of all kinds of which there were less than 71 cases, that is less than 1 per cent. of each.

Classification

To the general physician there is some danger of headache being an unclassified symptom, although Galen long ago began to put headaches in order according to where he thought the pain arose. There was presumption in his classification; and if there is less in that of others as knowledge increases, there is still a good deal. Certain clinical types stand out, such as migraine, uræmia, and cerebral tumour, but many headaches do not conform to a clinical type, and often we are not sure of the real cause of the pain. To think, however, of a headache, or of any symptom, in terms, so nearly as may be, of its cause, is a help to the physician; since his aim is to remove the cause as well as to allay the symptom. I began therefore to work with a scheme based on what is known of the anatomy, pathology, or psychology of each type, compiled from plans drawn up by Liveing, Auerbach, and more recently by Wilfrid Harris, Gordon Holmes, and Pavey-Smith.

Such a classification of a large series of patients was of absorbing interest, each case being put into its place with the idea that the main cause of the headache lay here or there or was this or that. The list grew and grew until at last it dawned upon me that I was making an inventory, not only of all diseases compatible with consciousness, but also of most of the other ills that flesh is heir to. Any classification to be useful in practice must be confined to main headings. I make, therefore, no further

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* The Croonian lectures for 1935, delivered before the Royal College of Physicians of London on May 14th, 16th, and 21st. The lectures were illustrated by numerous case-histories and lantern slides.

apology for putting forward the following clinical scheme, which really made itself as the case-histories were perused.

All headaches here discussed are regarded as intracranial, that is, by the term headache we mean a pain felt inside the head. Neuralgias and pains of nerves serving the surface of the head, such as tooth-ache, face-ache, shingles, are not included unless there was also headache.

SCHEME (500 CASES)

			Cases:
I.	Organic:	Intracranial disease	26
II.	Vascular	.. ..	50
III.	Toxic.	Nephritis, allergic, endocrine (including menopause), anæmia, alcohol, tobacco, other drugs	71
IV.	Reflex: and/or toxic.	Rheumatic (spine, muscles, and joints), diseases in head, chest, abdomen	150
V.	Functional: sometimes recognisably reflex.	Migraine, asthenia, nervous exhaustion, neurasthenia, psychasthenia, mental	203

It will be seen at once that none of these divisions has a definite boundary, each tending to pass into the next group. For example, cases of disease of the blood-vessels in the brain in group II. might be placed in group I. of organic disease in the cranium; the headache of nephritis, which is classed as toxic, may be found with, or follow upon, the headache of hyperpiesis. The functional headaches again, and especially migraine, might, many of them, as will be shown later, be put in the classes above of reflex or of allergic headaches, whilst gradations of others are found leading through the neurasthenic group to the psychotic or insane.

It is uncommon to find a person with headaches who has not more than one obvious cause, mental or physical, of ill-health, to say nothing of causes that are not recognised. The placing of any case in any group has been therefore a matter of opinion and judgment, of the value of which the lecturer is far from confident. The result of treatment is of help. If one factor is removed or its influence lessened by any measure taken, and improvement follows, the view that it was one of the causes of the headache is supported. Groups of illnesses which are poorly represented are infectious diseases and septic conditions coming mainly under the care of surgeons. Headaches due solely or chiefly to gynæcological disorders are also probably under-represented. In the whole series, counting menopausal and menstrual headaches and other gynæcological conditions, there were 69 cases occurring among 309 women, or roughly 22 per cent.

The sexes were in the proportion of three women to two men, the figures being 303 women and 197 men. The average age of the patients on admission is shown in ten-year periods on Fig. 1. It will be seen that the women were rather more liable to headaches from 20 to 40, the men later, whilst after 60 the curves run together. The average age at admission of the persons in the different groups is shown in Fig. 2. The 103 migraine patients were divided into three groups according to the age of onset—before 20 (65 persons), from 20 to 33 (20 persons), and after 40 (11 persons). In 7 the age of onset was not stated. The youngest groups on the chart are those of the psychasthenic and asthenic, and then the 20 to 33 migraine group. The cases of migraine arising before 20 were admitted a little later on the average. Then come, as the age advances, various forms of reflex and toxic headaches, leading up to the groups of nephritis and cardiovascular disease in the sixth decade of life.

Organic Headache

There were 26 cases in this group, or 5·2 per cent. of the whole. The various diseases included tumour, hæmorrhage simulating tumour, meningitis, encephalitis lethargica, disseminated sclerosis, and headache after trauma. *A chief feature of the more acute and progressive intracranial lesions is the severity of the pain.* Analysis of the cases shows the difficulty of diagnosis of tumour at an early stage and the danger of accepting a neurotic history as an explanation of present symptoms; also some recoveries after tumour, subarachnoid hæmorrhage, and cerebral syphilis.

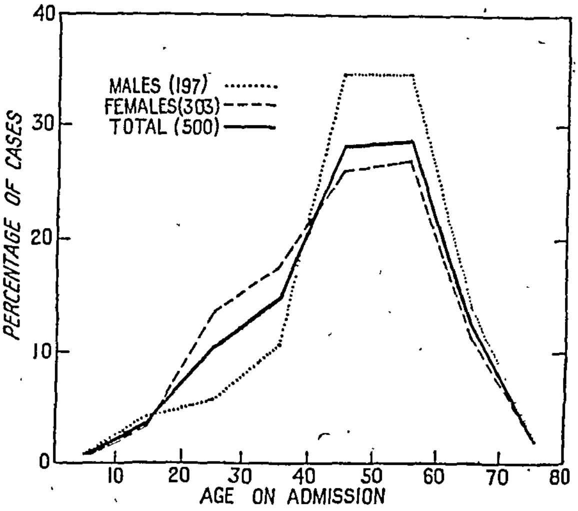

FIG. 1.—Age-distribution of patients admitted to hospital for headache.

Vascular Headache

HYPERPIESIS

In this group there were 37 persons, 24 men and 13 women. There were also 53 cases with raised blood pressure among the other groups, and especially the nephritic group, their headaches not being judged to be due solely or mainly to hyperpiesis. Thus in the whole series of 500 there were 90 cases of raised blood pressure. During the period under review of ten years 411 cases are indexed as suffering clinically from hyperpiesis. From that figure it would appear that under *one-fifth of the cases of hyperpiesis* were subject to headaches.

The site of the ache tended to be more frontal and vertical than occipital. The figures are—eyes, frontal, temporal, and vertical 20, diffuse or not mentioned 17, occipital or neck 10. Six of the female cases were at the menopause, a time of life when both headaches and a rise of blood pressure are likely to occur. Excessive use of tobacco is noted in 5 of the men, and of alcohol as well in 3. The *association of nervous strain with hyperpiesis* is close; in 15 out of the 37 patients severe nervous strain, business worry, or other anxiety was admitted.

Hyperpiesis in well-established cases has, of course, dangers that are not far away; in this series 10 of the patients had died within three years and 1 other, a severe case, seven years later. Nevertheless great and almost constant improvement in the headache and other symptoms can be obtained in this group by removal from the scene of anxieties, by regular rest and exercise, diet, venepuncture, and other measures as called for. The blood pressure falls, the headaches lessen, and some cease. Thus, of the 37 patients, 8 were examined and advised but not treated. The remaining 29 came under treatment, and benefit at the time was obtained in all, and in many of the less advanced was maintained later. This result is remarkable, and in its completeness unexpected.

An active nervous man of 47 complained of headache, giddiness, and irritability. B.P. 240/140. In seven weeks' treatment the headache disappeared and the B.P. fell to 200/116. Two years later he was readmitted complaining of tingling in hands and feet and back of head. These symptoms also disappeared and he has followed a moderately active life for three years since last admission.

A raised blood pressure was detected at the age of 46 in an overworked intellectual married woman subject to severe responsibilities and strains. An artificial menopause was induced with radium. Admitted at the age of 53 with prostrating frontal headache with photophobia, nausea, and vomiting; also, between these attacks, a duller headache with giddiness. Cardiac hypertrophy, mitral leak. B.P. 205/120. Moderate secondary anæmia. During 2½ months' treatment the pressure fell steadily and all symptoms ceased. This lady returned to her home and duties which she was able to resume, and with intermittent periods of treatment carried on for six years longer, when cerebral hæmorrhage occurred.

The striking benefit which follows rest, freedom from daily worries, and other appropriate measures cannot fail to call for the further question—How much more could the lives and the mental and physical activity of such patients be prolonged if they did not return so soon as possible to their former circumstances? Many are obliged to do so. There are, however, not a few who regard any improvement as a sign that they may plunge again into the activities and habits they enjoy, when there is no need; whereas a continuation of a quiet régime would ensure a longer and more efficient life.

OTHER VASCULAR

A group of 13 cases of cardiovascular disease contains patients most of whom would probably be in the hyperpietic class were it not for valvular or muscular disease of the heart. These were cases of serious illness. The headaches were vertical, frontal, and diffuse—none occipital. Six responded well to rest and treatment at the time.

Toxic Headache

NEPHRITIS

The main group of headaches in the toxic class, of a prognosis as grave as that of the organic intracranial group, is the class of chronic nephritis. In this group were 21 patients, 16 men and 5 women. None gave a family history of headache. In the majority the headache was persistent or frequent, but intermissions are often complete. In the same period of time 72 other patients with chronic nephritis were admitted in whom headache was not a prominent symptom. All but two of the cases were the subjects of hyperpiesis. It is therefore debatable whether the headaches are due mainly to the high pressure in the arteries or to the deficient excretion of the kidneys. Uræmic and nephritic headaches as a rule start in later life. A previous history of headaches may obscure the diagnosis. Three of these patients, for example, had been subject to migraine with aura from childhood; and in one the nephritis had been unsuspected until it was advanced to uræmia.

The site of the ache in this group was mainly frontal, temporal, or diffuse. In only one was it confined to the occiput, though four others mentioned that region. All the headaches, except a migrainous one above-mentioned, were bilateral. The causes or accompaniments of headaches prominent in other groups were conspicuously absent in this one. For example, special nervous or psychical symptoms were noted in two only of these patients. Delay in the colon was uncommon, excess of tobacco is mentioned in four and alcohol in only three, in two of whom the excess was in former years. Retinitis and uræmia were frequent and 13 of the group are known to be dead.

The cessation of headache in this group, though a great relief to the patient, does not necessarily mean that the progress of the disease is arrested. The headache may disappear as may other symptoms in severe cases when the patient comes under hospital treatment; and a man who is passing quickly into uræmia may feel and look much better for a time. The relatives, when the gravity of the case is explained, wish to take him home, and sometimes persuasion has been needed to get the patient to agree without arousing alarm in his mind.

Other cases are of intermediate severity and respond well to treatment. Under a suitable régime they may live two, three, or more years free, or nearly free, from headache and other symptoms, and with a degree of efficiency for work. In a few, better results still may follow; and, rarely, an apparently severe case may recover. Such recovery is, in my experience, associated with an infection that could be removed. In the following example, sepsis about the teeth seemed to be the cause.

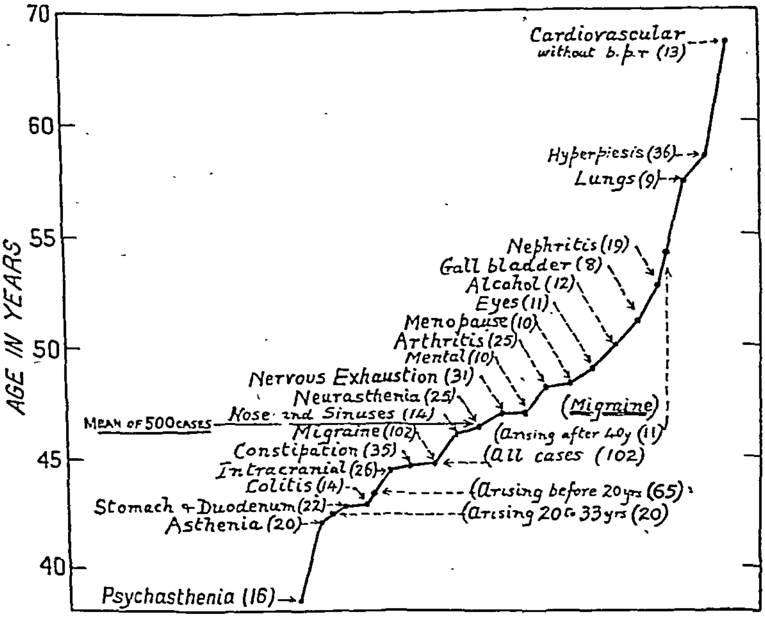

FIG. 2.—Average age of groups. The number of cases in each group is given in parentheses. Six cases of unknown age are omitted.

A man of 47, a hard worker in business and in public life, complained of a light feeling in the head which developed later into an ache. He was tired, irritable, and increasing in weight. Tobacco and alcohol were rather excessive, though not out of control. The B.P. was 210/120, the urine contained albumin and casts but gave a fair range of excretory power. In the fundi the arteries blocked the veins and there were retinitic patches and hæmorrhages. Many teeth were septic with apical abscesses. The outlook appeared grave.

The infected teeth were removed and a complete rest from work taken, with regular exercise, massage, and other treatment. In a month general improvement was manifest. The headache was almost gone and there were fewer inflammatory patches in the retina. The blood pressure had fallen to 180 and then to 150 systolic. There was less albumin in the urine, now no casts. Half a stone of weight was lost.

The patient returned home and lived very carefully for a long time, avoiding alcohol and smoking little. Later he began to take up public work again. He was seen five years after admission, looked and felt well, and was doing full work. It was difficult to recognise any abnormality in the retina.

In 34 cases of gout, 174 of diabetes, and 140 of anæmia of various kinds headache was uncommon. Among a group also of various fevers and infections headaches were frequent and variable, but called for no special comment.

HABITUAL HEADACHES

So far all the sufferers were the subjects of serious disease. Before passing on to consider the less dangerous forms of toxic headache, and the reflex and functional headaches, I will discuss briefly headaches which have become a habit. The causes of habitual headaches can be regarded as of three orders.

First, the tendency. This is often hereditary, and out of control of the doctor or patient. If, however, by any means the recurrence of headaches can be avoided or prevented it appears that the tendency may be lessened.

The second order of causes of headache includes any constant disease or abnormal state of body or mind which depresses the health. These are the conditions for which inquiry and search is made by the doctor. This is his field of work. The relief of such a disease, focus of infection or irritation, or mental anxiety may do much good. And if, as is common, or usual, there is more than one disorder, the relief of one factor only may be of much benefit.

The third order of causes of headache is that of the immediate exciting causes. The patient often, though not always, knows what is likely to bring on a headache. When he does not the doctor can help him to find out. The exciting causes, when ascertained, are, so far as may be, under the control of the patient.

The same kind of nervous or physical disorder may be either a constant or an exciting cause; examples are anxiety, overwork, eyestrain, or constipation. A study of the history, and the examination, usually lead to a definite view in this matter, which is confirmed or otherwise by the result of advice and treatment.

Nervous and Psychical Influences

The writings of those who are interested in observing any one morbid state or disturbance as a cause of headaches are often charming and convincing, whereas the laborious task of recording and reviewing a large number of cases is suited to a more humdrum and stolid mind. We have had in recent years able advocacy of various causes of migraine—e.g., of allergy, diet, endocrine dysfunction, eyestrain, and of psychical influence. All have an element of truth, but the factor to which the study of this series gives the largest volume of support is the nervous or psychical factor.

The frequency of mental stress as a constant and as an exciting cause of migraine has long been fully recognised. Such causes are, however, frequent in other forms of headache as well. In this series the records were taken impartially by different *physicians with no tendency to any point of view, or* knowledge that an analysis was going to be made. Nor was I predisposed to lay especial stress upon nervous influences. For many years, as occasion offered, I had drawn attention to the frequency with which, when a patient has been sent for observation or treatment as a neurasthenic, an investigation had shown that an undetected lesion had long been present causing the disturbing symptoms. Although most people would not rejoice to be told they had any form of organic disease, yet to one to whom nervous and psychical reasons had been offered for years to explain physical pains the relief was enormous. He had been, therefore, much interested to find that a definite nervous disturbance obvious or confessed, was recorded in the whole series in 228 out of 500 = 46 per cent. and in migraine in 51 out of 103 = 51 per cent.

The difference, therefore, is not great in this respect between migraine and other headaches.

Nervous influences, though they are mentioned in every group, are, as would be expected, less frequent in some. Such are the groups of organic intracranial disease, heart and vascular disease (though not hyperpiesis), nephritis, diseases of nose and sinuses, lungs, stomach, gall-bladder, and colon. In the groups of migraine, asthenia, nervous exhaustion, neurasthenia, the figures for recognised nervous stresses are naturally rather higher.

The subjects of nervous strain may be roughly classified as follows:—

First come the folk who are by nature unstable, the neurotic and the neurasthenic. These are upset by causes which in other people are followed by no recognisable result or reaction.

A second class includes those who have suffered undue strain from over-exertion, mental or physical. These include cases of nervous exhaustion and overtiredness. Neurasthenics are commonly told that they are suffering from nervous exhaustion. This is a pardonable kindness or compliment, and is true enough in one sense as they are exhausted easily by minor pains or strains. But in practice there can be a plain distinction between neurasthenia and genuine nervous exhaustion.

A third class contains those who are not so much overworked as anxious or worried, either about those dear to them, or business, or their own health, or other troubles.

The nervous state in the second and third groups is essentially acquired, with, in many, a degree of predisposition.

The numerical relations of these classes were as follows:—

I. Neurotic	Nervous	56	87
	Neurasthenia	31	
II. Tired ..	Nervous exhaustion	17	51
	Overtired from want of rest and various causes	34	
III. Worried	Various worries	32	90
	Anxiety about others	31	
	,, ,, business	18	
	,, ,, own health	9	

The neurotic, obviously predisposed, class made up rather more than one-third of the whole.

The late Dr. F. G. Crookshank was an eloquent exponent of the nervous or psychical influences in headaches. He wrote :—

> "The man or woman who complains of migraine or of trigeminal neuralgia is, I think, without exception, placed in some situation that gives rise to an unexpressed or unrecognised emotion of, to use Adler's words, rage and humiliation."

Taking this statement in a very general sense it appears to be true in this series of about half the cases of migraine and nearly half of the cases of headache in other groups. That headache is bound with some unhappiness is not a modern idea. Dr. Crookshank quoted from the "Anatomy of Melancholy."

> "Socrates, in Plato, would prescribe no Physick for Charmides' headache till first he had eased his troublesome mind; body and soul must be cured together, as head and eyes."

We are all bearers of the burden of disappointment and of lack of fulfilment in life or work. Some, from innate mental weakness, can carry but little, in others strength is worn down, whilst many are blessed with the power to bear and forbear.

There is a family similarity between a highly strung patient subject to migraine, or other form of headache, and other persons subject to odd days of depression, with or without alimentary disturbance. Such instability may be associated with unusual sense of atmosphere, and with vivacity and charm. People are apt not to look fairly at both sides of their own balance sheet. The assets—their gifts—they claim and rejoice in as a real part of themselves. The liabilities—limitations—they regard as outside them and ask the doctor to take them away—a very human attitude which must enlist the sympathy of each of us.

Does a placid self-contained person attain to quite the same skill or charm as he or she who is capable of depression, headaches, and despair, but can also rise to heights of skill, energy, or genius? The thought, whether justified or not, may be a comfort to all who have black hours.

If mental conflict, strain, anxiety, disappointment, or lack of fulfilment is so frequent as to be recorded in at least half of the cases of headache in this series, the question arises: How can such influences be lessened or abolished? Does the mere revelation, ventilation, and discussion of a conflict or a grievance relieve it? In some cases it is certain that it does. The novelists have never doubted. When the secret of iniquity, injustice, or suspicion is once out, there is general forgiveness or explanation; and the story soon comes to an end. In practice, however, many of the stresses revealed to the doctor, and particularly, perhaps, to a doctor who is at a distance from the patient's home, cannot be explained to those who, after the patient, are most concerned. Nevertheless, revelation still does good, a discussion may lead to advice which will help the sufferer to face difficulties and to remove them, and in many matters confession remains, now as always, good for the soul.

In the following cases, one in the group of nervous exhaustion and one of migraine, termination of a continual strain and conflict was followed by relief of headaches.

A widow of 57 with five children, with no family history ad rem, developed a periodic prostrating frontal headache which passed down to the bridge of the nose, relieved by the vomiting of mucus. There were symptoms of a non-progressive lateral sclerosis affecting both legs, especially the right, which dragged. W.R. negative. Caseous glands in the abdomen. A tentative diagnosis was that of scarring from an old intramedullary tuberculoma. There had been a great nervous strain, and the patient's circumstances were still full of daily worries from the senile irritability of a parent with whom she lived. With six weeks' treatment and encouragement there were only two less severe headaches. On returning home periodic headaches recurred. A change of circumstances with removal of the continual strain was followed by renewed health.

A woman of 28 had suffered in childhood from bilious attacks, preceded by seeing stars. She now sought admission for the relief of diffuse headaches. Omission of various foods had been tried without benefit. The home life was unhappy and unfulfilled. With later happiness and the birth of a child symptoms ceased, and five years after admission she is well.

The revelation, and in some the removal, of a recurring anxiety borne for years was followed in many other cases, as in the two quoted, with great benefit; but not in one or two. For some all strains may pass but that of memory, and who can estimate its force?

Rheumatic Headache

Passing over endocrine disturbances associated with headache at the menopause, with pituitary dysfunction, or with diabetes insipidus of pituitary type; and with mere mention of toxic headaches from alcohol, tobacco, heroin, and other drugs, I turn to a group of 26 persons, 18 women and 8 men, complaining of *headaches associated with rheumatic changes* especially in the spine and its connected muscles and fibrous tissue. In some no bony change can be detected in the joints. These are called fibrositis. In the acuter forms of lumbago and stiff neck they might be called fibromyoneuritis. In the more chronic cases there is stiffness and pain in joints, and sometimes creaking, and more or less bony change can be seen with a careful X ray examination. New formation of bone may, of course, press upon nerves emerging from the spinal column. It is surprising, however, how an advanced spondylitis may offer no painful evidence of nervous involvement, and sometimes much less restriction of movement than would be expected.

Many cases of fibrositis and arthritis of the neck and back are investigated with the hope of finding a focus of infection to which the rheumatic symptoms are secondary. In a proportion this search is successful and appropriate treatment leads to benefit. In others, and especially in arthritis of long-standing, it should be remembered, and before removing innocent parts of the body, that an original toxic process or focus may be dead and gone, leaving its damage behind it.

Most of the rheumatic headaches were intermittent, three persistent. The ache tends to be in the hinder part of the head, but it is not confined to that area. In 6 of the 26 it was entirely frontal or temporal. In one whose headaches did not begin till the age of 58, there was an aura of aphasia and spots before the eyes preceding attacks of dizziness and suboccipital headache. The association of overwork or other strain or nervousness was frequent, being noted in 14. In 10 of the 26 the diagnosis was fibrositis, no clinical or radiological evidence of arthritic changes having been recognised. Here is one such:

A man of 49 was wakened with aching in the neck and stiffness which developed into a headache and might last all day. Many of the teeth were infected and loose, and he was suffering from business and family anxieties. The cervical spine was normal to X rays.

The following is an example of a severe periodic headache, approaching the migrainous type, in a young man with fibrositis.

A man aged 32 years. Some pains around the spine began at about 15. At 21 the headaches began and, according to the patient, had been made worse by a course of vaccines. They are severe at the back of the neck and all over the head "like nerves on fire," passing into the right side of the body and thigh, and may lead to vomiting. No aura. On examination no bony changes were found. The headache is more likely to come on if he sleeps late—a migrainous feature.

The following is a case of headache with arthritis of the spine and fibrositis:—

A woman of 61 complained of an occipital headache which had been getting worse for the past 15 months. She suffered also pains in the neck, right arm, and occasionally in the leg. There was moderate colonic delay and she was overtired with the care of an epileptic child. There was spondylitis of the fifth and sixth cervical vertebræ. With six weeks' rest and treatment, including ionisation, the headaches ceased.

The following is a case of a severe periodic headache without aura, nausea, or vomiting, arising in adult life, associated with cervical spondylitis, and responding to treatment.

A woman of 41. Influenza three times in six months at 25, after which headaches began gradually. At 35 an operation for retroverted uterus, and a year later the tonsils and some teeth were removed, without benefit to the headaches, which increased in severity and frequency, occurring with intervals of ten days to a month and lasting three days. The night before a headache there was usually discomfort in the epigastrium. About 4 A.M. she would wake up with a nightmare. Pain then developed in the head and neck, with weakness of the left arm and shoulder, which were sometimes tender and stiff. There was pallor, prostration, and photophobia. Some relief was obtained by complete rest, with little food and aspirin. The patient was tired, anæmic, and moderately constipated. There was cervical spondylitis. An attack which occurred under observation was arrested by complete rest, glucose, novalgin, and the use of a suppository. After examination a régime was advised, including regular rests, massage, and diathermy to the neck muscles, and a suitable diet for the bowels, and the patient returned home. Eight months later had had three headaches only, each following overtiredness. Liable to headaches 18 months after, but they are less severe and can be more easily avoided and controlled.

Other Reflex and/or Toxic Headaches

In a small group of cases secondary to disease of the ear the site of the headache was temporal, parietal, or occipital.

EYE-STRAIN

In occasional cases of disease of the eyes, such as glaucoma and iritis, the headache was frontal and vertical. Two of the patients suffering from acute disease of the eyes, needing immediate treatment, had been subject to headaches from childhood. Such a history should not prevent as careful a search as if there had been no headache before.

Eye-strain from errors of refraction is a well-known cause of headaches; and in a great number of cases in this series the eyes had been examined and glasses used for a long time. That may be the reason why the number of patients whose headaches appeared to be mainly due to eye-strain was small. There are a dozen or so in whom no other factor appeared to be of importance; and to these must be added several in whom eye-strain was one of two or more factors. The site of the headache in this group was behind the eyes, frontal or vertical. In one only was there an ache further back, in the neck, which was accounted for by some cervical spondylitis. In that case, however, the astigmatism was the important factor as the headaches were relieved by more accurate glasses. Nervous instability or strain was prominent in this group. Reading and sewing is mentioned, or is found on inquiry, as bringing on the headache. The time of onset is more likely to be later in the day. In one only, in whom there were other factors, was there the history, so frequent in most groups, that the ache came on waking. In several cases complete relief followed the use of suitable glasses. In some in which the causes of headache were multiple, or in which the errors of refraction were difficult to adjust, with muscular weakness, relief was partial but definite.

NOSE AND SINUSES

Nasal catarrh, with or without septal abnormalities and antral disease, was mentioned in 40 cases in this group of headache patients, and in the whole number of patients 125 times. In a group of 15 the headaches were ascribed solely to these causes. Men and women were in equal numbers, as they were also in the eye-strain group. Headache from this cause may be regarded as toxæmic or as a reflex pain. It was usually intermittent; in one only persistent. The following case illustrates these points:—

A man of 28 had suffered for 18 months from pain about the right eyebrow, and a vertical headache, sometimes passing to the left. Seven months ago both turbinate bones were removed with relief. Recently the headache had returned. It was dull, worse on lying down. He was inclined to fall forward on stooping. On examination he was tender above the bridge of the nose. Diagnosis: right frontal sinusitis, confirmed by X ray.

The deceptive intermittency of a headache from sinusitis is illustrated in the following two cases:—

A woman of 65, the subject of an ulcer at the lower end of the œsophagus, complained of a stabbing headache around the right eye, which was the seat of cataract. During the three months of a successful treatment for her ulcer the headaches vanished. Later there was recurrence and, after a tiring day, the pain became severe, extending to the forehead with a fifth nerve neuralgia. Pus was found in the right maxillary antrum. After its evacuation the headaches ceased.

A young woman developed right maxillary sinusitis after influenza for which a radical operation was done. Severe headaches with resulting faintness and giddiness, made worse by reading and sewing, continued, and all the teeth were removed. Two years later she was admitted with a right fifth nerve neuralgia, following a cold, and swelling of the right cheek. This subsided. The sinuses were reviewed by a rhinologist who was unable to locate the focus he believed to be present. A severe occipital headache then developed, and at operation the right ethmoid cells were found to be infected. Complete recovery. Eighteen months later the patient states that she is free from headache and "a different person."

Cases of headache which are relieved by correction of a deflected nasal septum are reported from time to time. There was one such in this series. In another operation was advised but the patient recovered without it, from treatment for the general asthenic state.

STOMACH AND DUODENUM

In organic disease of the stomach headache was infrequent. In a period of time during which 192 cases of gastric and duodenal ulcer alone were treated, also 57 cases of growth and large numbers of other diseases or disorders of the stomach and duodenum, there were 22 cases regarded as associated definitely with a gastric or duodenal lesion, 14 women and 8 men. The headache was prominent in all and, with three or four exceptions, was bilateral. The pain was usually in the forepart of the head. In two only was it occipital, one of hour-glass stomach, and one of an ulcer in the œsophagus just above the cardia.

Cases of gastritis, liable to be complicated, as regards the possible relation to headache, with alcohol, tobacco, or other factors, all did well with treatment.

A patient with achylia and intermittent diarrhœa complained of a frontal headache which came on when he was tired or if the bowels were not open. He improved steadily with treatment, and four years later reports that headache is rare.

A direct relation of the headache to the gastric discomfort is clear in some of these cases.

Thus in a woman of 59 with gastric ulceration a right frontal headache came on with the abdominal pain, and ceased to do so after successful medical treatment.

In a case of hypotonic gastric delay the headache ceased within a month with treatment. Four years later the patient was free unless she ate unwisely.

In another young woman with gastric delay, due to obstruction from adhesions after an appendical operation, an ache over the eyes accompanied this feeling of fulness in the upper abdomen and was relieved by gastric lavage. After obstruction had been circumvented by operation the headaches and indigestion ceased and 2 st. was put on. Headache now occasionally only when overtired.

In one patient pain in the right side of the head was associated with abdominal discomfort from a duodenal pouch.

In speaking of rheumatic headaches an example was given of a severe periodic headache which developed in adult life associated with arthritis and anæmia. A similar development seemed in the case now to be related to follow gastric ulcer.

A woman of 31 had suffered about every fortnight for two years from a one-sided headache. There was abdominal discomfort and blurring of the eyes on the preceding day. In the morning the pain came on and lasted three days, ending in profuse vomiting, which was aided by drinking hot water. She was the subject of a gastric ulcer with much gastritis around it. With 11 weeks' treatment the stomach recovered. All symptoms ceased. Eighteen months later this patient is liable to a short and less severe headache at the period, but at no other time.

GALL-BLADDER

The relation of a diseased gall-bladder to headache has received attention recently. In a thoughtful paper with a review of a series of cases by T. C. Hunt it is suggested that in migraine the gall-bladder shares in the visceral stasis, such as may be observed in the stomach musculature during a severe headache, and is made more liable to yield to infection. The diseased gall-bladder is therefore regarded by him as possibly a result rather than a cause of headache. In this series the gall-bladder was known to be abnormal, or was suspected clinically, in 358 cases in the whole period under review = 7 per cent.

In the 500 cases of headache, in 17 stones were present, 8 were the subject of cholecystitis without recognised stones—i.e., 25 diagnosed cases of gall-bladder disease = 5 per cent. Disease of the gall-bladder, confirmed by cholecystography or operation, was not, therefore, more frequent in the patients with headaches than in others. There were 5 cases recorded among the 103 migrainous—the same proportion as in the headache cases in general.

The first clear case that came under my care was long before this series was observed. A man of 43 had been subject to migraine, beginning with a central scotoma, since he was 13. Attacks were recurring every few weeks. Gall-stones were present, the removal of which restored him to health. In this case we have a good example of what I have called the second order of causes of headache. The migraine had been recurring for 30 years, and it is probable that the gall-stones had been present for only a part of that time. Nevertheless, the removal of the irritation, or toxæmia, from the gall-bladder was of benefit to the migraine.

APPENDIX

That reflex or toxic headaches may occur in appendical disease is well recognised. Two examples are here given of chronic recurring headaches, one, with a history of nine years, in a boy, and the other in an elderly person.

A boy of 13 had suffered every 10 to 14 days since he was four years old from a frontal headache. One of these attacks, which was observed, began about 11 A.M. with sore feelings in the eyes. The pain soon became severe, and at 2 and 3.30 he vomited, the headache passing off about 6.30 P.M. He was frail and highly strung. The blood-sugar was normal in the attacks. X ray examination showed a bulbous appendix. After its removal he had one "sick turn." Nine years later his family doctor writes that he has had no headache since.

A woman of 60 had had appendicitis and jaundice, each twice, and separately. She complained of headache across the eyes, nausea, poor appetite. Pain in a recent feverish attack had settled in the right lower part of the abdomen, which was tender. With X rays the appendix did not fill and its site was tender; the gall-bladder gave a poor shadow with dye. Operation was advised, at which a diseased appendix was removed. The gall-bladder was healthy. Pleurisy delayed recovery. A report six years later says she lives a busy life and hardly ever has a headache.

COLITIS

Headache occurred in 16 per cent. (61 cases) of the 369 cases of colitis in the period under review. Many were complicated, but in 14 cases of various forms, including mucous, post-dysenteric, and ulcerative colitis, the headache was ascribed to the colitis, and improved with it.

CONSTIPATION

The relation of constipation to headache is universally known, the relief of headache and malaise by aperients being a commonplace of household medicine as well as the basis of considerable vested interests. Instances of temporary relief of headache by evacuation of the bowel are frequent in all groups of headaches. In habitual constipation also an aperient empties the bowel and relieves quickly an associated headache. It does nothing to cure constipation but tends to perpetuate it, replacing the natural stimulus and its resulting muscular efforts, both intestinal and somatic, by a foreign stimulus and an evacuation often abnormally loose and complete. If a regular habit can be established without irritative aperients, the recurring headaches can often be avoided.

In this series the complaint of constipation was usually confirmed or otherwise by ascertaining the rate of passage with barium, or, in a few instances, with charcoal. There are those who complain of constipation, and take aperients regularly, in whom the rate of passage is normal. These are not included.

A great many people are, of course, constipated who do not have headaches. In this series constipation was recorded in 170 out of the 500 cases. In many the headache was regarded as due mainly to other conditions. In a group of 35 it was attributed to the constipation, a conclusion which was usually justified by the result of treatment. Of this group 26 were women and 9 men. In none was there a history of headaches in early life. The site of the pain was in the fore part of the head, or diffuse—e.g., behind the eyes 10, frontal 8, temporal 4, vertical 2, &c. In 3 only was it confined to the occipital or suboccipital region. In 5 premonitory symptoms were mentioned, but none were entirely typical of a migrainous aura. Specks, stars, dizziness in the neck and on the right side, feeling ill and out of sorts and being "able to tell when a headache is coming" were among the details mentioned.

Some examples may be given :—

A woman of 58 complained of "perpetual" occipital headache, which was relieved only when the bowels were opened by aperients.

A woman of 22 complained of constipation since the age of 16. If more than four days passed without an action a headache developed with nausea and vomiting, obliging her to go to bed. With suitable treatment a regular action of the bowels was established without irritative aperients, and there were no more headaches.

The following is an example of severity both of constipation and headache :—

A young woman had always been subject to constipation which grew much worse after hysterectomy at the age of 30. Headaches then began and became severe. They occurred once or twice a month, coming on in the early morning, or at any time, above the eyes, and lasting two to three days ; relieved by lying in the dark, and aspirin. On admission at the age of 39 aspirin was losing its effect. With remedy of habitual constipation the headaches ceased, and four years later have not recurred.

It will be understood that my experience is largely with severe cases. In milder ones the treatment need not be institutional. It must be admitted, however, that patients who have been subject to habitual constipation for years are inept followers of any régime except that of purges, unless carefully controlled and encouraged.

A woman of 54 had suffered from headaches for ten years, worse the last year. They were occasional only, about every two months, but severe, confining her to bed for three days with nausea, pains in the back, and vomiting. There was much delay in the colon. Aperients were taken weekly. There was a mild secondary anæmia : 75 per cent. Hb, 3,800,000 red cells. After the period of observation a régime was suggested, and was continued by her medical adviser with a good result, confirmed by a recent report six years later.

There is, of course, a tendency for headaches to cease with advancing age ; but in many of these cases that factor can be excluded, for patients of all ages have found repeatedly that a relaxation of the routine of regular effort and suitable food has led to return of constipation and headache.

In not a few there are complications, but it is important to treat constipation always, as that treatment alone may do much good.

Thus, an active intellectual woman of 47 complained of left-sided and suboccipital headache, especially when sleep was poor. She was the subject of valvular disease of the heart, and the blood pressure was 185/100. Treatment was directed to the vascular state as well as to the bowel, in which the delay was mostly rectal. She did well in two months' treatment. Nine years later her doctor writes "the acute headaches disappeared together with the constipation."

Especially resistant are the cases in which visceroptosis and lack of muscular tone have led to the latter part of the large bowel becoming bunched up in the pelvis, sometimes adherent. In some of these, with time and perseverance, a good result may yet be attained.

Thus in a woman of 29, who had become an invalid, with constipation, backache, and a "full" diffuse headache, in two months, with physical and tonic treatment and encouragement, regular actions were obtained, accompanied by steady improvement, which has continued.

(To be concluded)

GOLD TREATMENT OF RHEUMATOID ARTHRITIS

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THE belief in a relationship between tuberculosis and certain forms of chronic arthritis has existed on the Continent for many years, and as a result of this belief chrysotherapy has been extended to the treatment of rheumatoid arthritis with considerable success. Among others, Forestier[1] and Coste[2] in France, Umber[3] and Zimmer[4] in Germany, and Secher[5] in Denmark, have had a wide experience of gold as a remedy, and they appear to be satisfied that it is a distinct advance in the treatment of what had come to be regarded as an almost incurable malady. In this country, however, it appears to have been little used ; there is no reference to it in recent editions of standard text-books, it is not mentioned in Ray's monograph on rheumatism[6] and the report of the British Medical Association Arthritis Committee[7] only mentions its use abroad and states that reported "beneficial results have not been confirmed." The only important British papers are those of Slot and Deville[8] and of Pemberton[9] (which has been published during the preparation of this report), although Buckley[10] mentions chrysotherapy and speaks of promising results in a limited experience of its use.

Having seen some of the satisfactory results obtained in continental clinics and being impressed with the poor results usually achieved by other methods, we determined a little more than two years ago to give the new form of treatment a thorough trial. This paper is based on our experience of chrysotherapy both in private practice and with hospital cases in the arthritis clinic of the Leeds Public Dispensary and Hospital. In the selection of cases obvious secondary infective arthritis (e.g. gonococcal) and osteoarthritis have been excluded and we have accepted for treatment all other forms of subacute or chronic polyarthritis, irrespective of age and sex. The majority have shown constitutional disturbances at some stage of the illness and we have accepted this, together with an increase in the blood sedimentation rate and X ray changes in the bones of the affected hands, as supporting criteria for the diagnosis in a large number of cases. No further selection has been made nor have any foci of infection been searched for or treated, other than the most obvious sepsis requiring treatment on its own account. Auxiliary methods of treatment such as physiotherapy, electrical treatment of various kinds, and massage have not been employed, and pain-relieving drugs of the aspirin type have rarely been prescribed.

Our results concern the treatment of 100 cases and cover the period April 1933 to March 1935 inclusive. An ætiological and clinical analysis is presented together with the results of treatment.

ÆTIOLOGICAL AND CLINICAL ANALYSIS

Age and sex.—There were 16 males and 84 females. Age-distribution at the onset of the arthritis and when treatment was commenced was as follows. There was no significant difference between males and females as regards age at onset.

Age group.	At onset of arthritis.	At commencement of gold treatment.
10–19	5	0
20–29	19	8
30–39	24	20
40–49	21	28
50–59	25	27
60–69	4	16
70 or more	0	1
Unknown	2	0

The *duration* of the arthritis was very varied and ranged from one month to 37 years. There were 17 cases in which the arthritis had existed less than one year, 21 from one to two years, 22 from three to five years, 19 from six to ten years, 15 from eleven to twenty years.

There was a *family history* of rheumatoid arthritis in blood relations in 20 cases and a history of rheumatic fever in 6. In 5 cases the patient had been suspected of pulmonary tuberculosis in the past, in 17 cases there was a history of tuberculosis in a blood relation, and in a further 5 there had been close contact with pulmonary tuberculosis. Thus, for what it is worth, there is an association with tuberculosis in 27 cases.

Physical type.—We did not find any predominance of a particular physical type. The cases were equally divided among individuals of slight, medium, and heavy build, but with regard to colouring 80 were dark or medium and 20 fair.

Type of onset.—The onset of the arthritis was acute in 65 cases and chronic in 35. In 64 there was considerable constitutional disturbance with marked loss of weight, debility, slight anæmia, &c. at the onset, while similar disturbances developed at a later date in another 9. In the remaining 27 there were no constitutional disturbances.

The joints most commonly affected at the onset were the small joints of the hands and feet—namely, in 39 cases (hands 24, feet 15). The next most common sites of onset were the knees 18, shoulders 11, ankles 9, spine 6, hips 4, elbows and wrists 3 of each. In 8 cases multiple joints were affected at the onset and in a further 5 the onset was generalised.

Progress.—The disease had usually spread to involve more than one joint. It had pursued a variable course, with exacerbations and remissions, in 20 cases. In 10 there had been rapid progression and 70 were getting gradually worse.

Previous treatment.—In order to show the effectiveness of gold, we have recorded the previous treatment (other than drugs) and the benefit obtained. The number of patients who had previously had one or more forms of treatment was 62. Of these 34 had had spa treatment, some on several occasions and usually at Harrogate, but only 5 of these claimed any lasting improvement. Diathermy or radiant heat had been given in 29 cases, and vaccines in 25. Nine of these 25 had had Warren Crowe's vaccine and 2 only claimed some relief; the remaining 16 had stock or autogenous vaccines of various kinds, 3 of whom thought that these had helped. Courses of massage had been given in 18 cases. In a further 17 focal sepsis had been treated, but in only one was any improvement claimed. Protein shock therapy had been used in 4 others with little effect, and 3 had been subjected to orthopædic procedures.

The *joints affected* at the time treatment was commenced were the fingers 94, knees 89, ankles 84, wrists 82, shoulders 82, feet 68, elbows 65, cervical spine 51, hips 45, lumbar spine 45, temporomaxillary 41, sternoclavicular 37, dorsal spine 33. For the sake of brevity no attempt is made further to subdivide the particular joints affected in the hands and feet.

Associated disturbances.—In 85 cases the pulse-rate was above the normal; in 33 it was between 80 and 90, in 12 between 90 and 100, and in 40, 100 or more. The blood sedimentation-rate was estimated before treatment in 78 cases, the Westergren method being employed. We have allowed a sedimentation-rate of up to 9 in the first hour as being normal. The rate was increased in 67 cases (86 per cent.). The actual increase in sedimentation-rate was 10 to 19 in 22, 20 to 29 in 14, 30 to 39 in 13, and over 40 in 18. We found 7 cases with anæmia, 13 cases had a markedly raised blood pressure, and 4 of these had slight albuminuria. Three patients had psoriasis, 1 diabetes, 1 a curious dystrophy of the nails, and 1 chronic chorea.

X ray appearances.—The hands were radiographed in the majority of cases but we do not intend to present any analysis of the radiological findings in view of the recognised difficulties in their interpretation.

METHOD OF TREATMENT

We have favoured the intravenous method of administering the gold salts using gold sodium thiosulphate, usually in the form of Crisalbine. Occasionally the intramuscular preparations Myocrisin and Solganol B. Oleosum have been employed, the use of these being limited to those patients in whom the superficial veins were small and the injections difficult.

During the two-year period we have given 1147 injections of gold salts, and of these 1027 were intravenous and 120 intramuscular; of the intramuscular injections 57 were solganol and 63 myocrisin. The total weight of gold salts thus administered was 198 grammes, given in 150 courses. The largest quantity of gold given to any one patient was 13·9 g. of gold sodium thiosulphate in 41 injections, comprising 4 courses spread over a period of two years. So far as gold sodium thiosulphate is concerned we adopted the following scheme of administration; 0·05 g., 0·1 g., 0·2 g., and thereafter 0·2 g. at weekly intervals until a total of not more than 2 g. had been given. This procedure, however, was widely varied from patient to patient, according to the particular reactions and the response. Depending on the progress of the case two, three or more courses were given, with an interval of at least six weeks between courses.

REACTIONS

Painful exacerbations in the joints occurred in 47 cases, and in 45 of these the pain was felt after one or other of the first six injections, but not later. Two cases had delayed pain reactions, both after intramuscular injections. The pain was usually noticed in the joints within 48 hours of the injection and lasted two or three days; quite frequently the pain was most severe the fourth day after the injection. We have come to regard such pain as a very good prognostic sign, and although our figures are not yet complete in this respect we can say that over 80 per cent. of patients who had such painful reactions went on to marked improvement or apparent cure.

The toxic reactions following the administration of gold have received wide publicity both in the lay and medical press. For this reason we have carefully recorded all the toxic manifestations encountered with regard to character, frequency, severity, and time-incidence. Toxic reactions have been observed in 45 of our cases in the following approximate order of frequency. The commonest reaction was a generalised pruritus which occurred in 36; of these 28 developed erythema and in 4 this went on to desquamation, in 1 case severe and generalised. Diarrhœa developed in 10 cases and 3 of these had abdominal colic. Soreness of the mouth was complained of in 9 cases and 3 of these went on to ulceration and complained in addition of a persistent unpleasant taste, while 2 others complained of dryness of the mouth. In 4 cases vomiting occurred within a few hours of the injection and 1 patient had immediate nausea without vomiting.

The urine was tested in every case at the beginning of treatment, in many cases before each injection, and in all cases showing toxic reactions. Albuminuria accompanied other toxic reactions in 12 per cent. of cases and occurred once as the only toxic reaction.

We have seen isolated examples of hyperkeratosis of the soles, pustular dermatitis of hands and feet, labial œdema, herpes zoster, erythema nodosum, lichen planus and purpura, all of which have been observed by others.[11] [12] We have not encountered any toxic manifestations in the central nervous system.[13] We have been impressed by the fact that all these reactions were not delayed but developed within a week of the last intravenous injection.

We have not been helped by the use of sodium thiosulphate, either by mouth or intravenously, in the prevention or amelioration of toxic symptoms; we have formed the impression that it is of little or no therapeutic value, and in the treatment of toxic disturbances we have relied entirely upon symptomatic measures.

Three of our patients have died.

The first was a woman, aged 32, who defaulted, having received 8 injections of crisalbine (total 1·0 g.), with much improvement of her arthritis; three months after her last injection she developed a sore-throat and she was admitted to St. James's Hospital when her total leucocytes had fallen to 2000 per c.mm. with agranulocytosis. She died after ten days and an autopsy was carried out by Dr. C. J. Polson who found the characteristic changes in the fauces and bone-marrow of agranulocytic angina. There was no evidence that this patient had taken amidopyrin. It is doubtful whether gold salts were the cause of this blood dyscrasia, for we have not seen delayed toxic symptoms after *intravenous* injection. At the same time we realise that gold has been held responsible for agranulocytosis. Toxic symptoms are, of course, delayed after *intramuscular* injection (e.g., Holmes[14]).

The second was a woman, aged 45, who had been crippled with arthritis for thirteen years. She had been treated with Warren Crowe's vaccine on and off for ten years without improvement. The preliminary tests as to suitability for gold treatment showed no contra-indications. She received two injections of crisalbine, each of 0·05 g., after which she immediately developed an itching erythema which went on to generalised scaling, a condition which lasted a month. The arthritis improved but no further gold was given as the immediate reaction after small doses suggested an idiosyncrasy and was unlike the toxic reactions with which we were familiar. Five months later, despite the knowledge of this severe upset, the patient was so impressed by the improvement seen in other patients that she persuaded us to recommence gold treatment. She was given a preliminary injection of 0·01 g. crisalbine, one-fifth of the usual initial dose, followed by a further four doses, making a total of 0·36 g. After the fifth injection she developed a fine petechial rash, and a week later there was a sparse purpura on the face and limbs; during this week there had been recurrent epistaxis and vaginal hæmorrhage. The blood count was now: red cells, 2,920,000; hæmoglobin, 40 per cent.; colour-index, 0·7; leucocytes, 8400 (85 per cent. polymorphs). Immediate admission to hospital was advised but for personal reasons this was refused. Ten days later she had a severe hæmatemesis, and the next day she was admitted to hospital moribund; she died before blood transfusion could be carried out. The blood count on admission, an hour before death, was: red cells, 2,540,000; hæmoglobin, 40 per cent.; colour-index, 0·8; leucocytes, 8700; the platelets had fallen to approximately 38,000.

A partial autopsy revealed multiple acute hæmorrhagic erosions of the gastric mucous membrane and there was altered blood in the intestine. Most of the viscera showed petechial hæmorrhages. The spleen was enlarged, the malpighian bodies standing out with a remarkable degree of pallor against the congested pulp. The left renal pelvis showed a large area of hæmorrhage extending into the calyces. The bone-marrow appeared normal in the clavicles, sternum, and ribs. There were multiple small hæmorrhagic infarctions in the lungs and considerable pulmonary œdema. The brain was not examined.

The third case was that of a woman, aged 63, who had suffered from arthritis for five years. The preliminary investigations showed a normal urine, blood-urea, and blood pressure; the sedimentation-rate was 34/58 and the pulse 98. She was given 4 weekly injections of crisalbine (total 0·85 g.), after which she was given myocrysin (intramuscular) owing to injection difficulties; she had five injections (total 0·95 g.) which were followed by itching erythema; after an interval of two months she had 4 more injections (total 0·6 g.) followed by a similar rash; after a further two months she was given 5 more injections (total 0·75 g.), making a total of 2·3 g. of myocrysin. The treatment covered a period of one year and was followed by "wonderful improvement." Seven weeks after the last injection she developed hæmaturia and later hæmatemesis, for which she was admitted to St. James's Hospital; a few petechial hæmorrhages were noticed on admission. Hæmaturia continued and the patient died after three weeks. An autopsy was again carried out by Dr. Polson who found subdural and sub-endocardial hæmorrhages, with blood in the stomach, intestines, renal pelvis, and bladder. Death was clearly due to purpuric hæmorrhage.

In reviewing these three deaths it is of interest that all have resulted from blood changes. We have no doubt that death in the second and third cases was directly due to the effects of gold, both patients dying of purpura. Compared with our other cases the second death followed very small doses and the third case had only received an average amount of gold; both women had previously shown cutaneous sensitivity of the common type. It is unfortunate that these cases did not come under our care during the terminal illness, and in no case was specific treatment instituted, such as pentose nucleotide in the first case or blood transfusion in the other two.

RESULTS

It is difficult to give a satisfactory classification of the results of treatment in chronic arthritis. A number of our patients were almost bed-ridden, incapable of dressing, washing, or feeding themselves and unable to walk; many had been in this condition for years, despite innumerable forms of treatment. Most of these cases have shown a remarkable improvement, often approaching a return to normal; but so long as there was any joint pain we continued treatment and such cases have been classified "marked improvement." For example, the patient who received the largest quantity of gold (13·9 g.) had been for four years unable to wash or feed herself and could only hobble a few yards on two crutches when treatment was commenced two years ago. At the present time she has no disability in her upper limbs, walks freely and unaided, and only complains of pain and stiffness in the right ankle; for this reason she is classified "marked improvement" and not "cure." It is interesting that this patient has become pregnant for the first time for fourteen years. We are convinced that no case is too far advanced to expect some improvement from chrysotherapy, though of course complete cure is more likely in early cases. Gold has no effect on ankylosis or subluxation.

Ten patients have been discharged as apparently cured—that is, with complete freedom from pain and disability other than that due to bony ankylosis. Most of them were severely crippled before treatment was commenced. Fifty-six cases are classified as "marked improvement"; this often gives but a poor impression of the degree of recovery, but all these patients still have some pain or disability and most of them are still being treated. Twenty-two have shown "slight improvement"; of these only two have completed one full course of treatment. Five, none of whom have completed a course of treatment, show no improvement in their arthritis. The remaining 4 patients defaulted at the beginning of treatment.

	Cases and per cent.
Apparent cure	10 (10·4)
Marked improvement	56 (58·7)
Slight ,,	22 (23)
No ,,	5 (5·2)
Died	3 (3·1)

In addition to the improvement in the arthritis there is usually a striking improvement in general health. Of 69 patients with significant upset of general health 51 showed marked improvement, 16 slight improvement, and 2 no improvement; none of the last two groups have completed a full course of treatment. In every case there has been improvement either in arthritis or in general health. There is usually a marked fall in the pulse-rate and blood sedimentation-rate after treatment. In the case of the diabetic patient her arthritis, which had been progressive despite all previous treatment, made a striking recovery and she was able to reduce her insulin from 28 to 6 units daily.

DISCUSSION

Gold has been used in the treatment of pulmonary tuberculosis since 1916 and the wide variability of tolerance of the individual has always been appreciated. There can be no doubt that at present we have no practical means of determining the optimum dose for the individual. In the case of tuberculosis we may cite Shaw,[15] who in 1930 referred to the previous "heroic dosage" employed and then proceeds to recommend three weekly doses of 1·0 g. of gold sodium thiosulphate, the total course consisting of 4·6 g. On the other hand the dermatologists have used minute doses of gold in the treatment of lupus erythematosus and have also occasionally noted toxic reactions.[11] Our own dosage has usually been midway between these extremes, and at the present time we are investigating the effects of still smaller doses.

Despite the frequency and occasional severity of the toxic reactions we have continued to use chrysotherapy. These unfortunate effects can in no way alter the fact that many patients have made a remarkable recovery. There can be no doubt that chrysotherapy is a most important advance in the treatment of what was so frequently an incurable disease, and like most other advances in therapeutics the experimental stages are being attended by occasional catastrophes. Despite these drawbacks we feel that gold gives more favourable results than any other single form of treatment and that it is curative and not merely palliative.

CONCLUSIONS

1. Chrysotherapy in relation to rheumatoid arthritis is still in the experimental stages, but we believe it to be the most important form of treatment. We have treated 100 cases over a period of two years with excellent results in 70 per cent. and some improvement in 90 per cent. of cases; these included many long-standing cases with gross disability.

2. Owing to the marked variation in susceptibility no rules as to dosage can be laid down and treatment must be individualised. In some cases treatment must be prolonged for two years or more. Probably the doses employed are still too large and it is possible that the interval between courses should be not less than three months.

3. Toxic reactions have occurred in half our cases. These are usually mild and do not contra-indicate further treatment. Hæmorrhagic reactions and exfoliative dermatitis, however, may be fatal and no more gold should be given to patients who develop them. Other than gross renal or hepatic disease, we have found no absolute contra-indication to chrysotherapy before the onset of these serious reactions.

4. Chrysotherapy should only be undertaken by those who are fully alive to its dangers. The patient should be warned of these possibilities. The urine should be tested before each injection. Especial care must be taken after the occurrence of toxic reactions. It is essential that every patient should be seen every week during, and for three months after, each course of treatment.

We wish to express our thanks to the almoners department of the Leeds Public Dispensary and Hospital for enabling us to keep close contact with out-patients.

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GOLD TREATMENT OF TUBERCULOSIS

A STATISTICAL STUDY

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IN attempting to assess the value of any form of therapy for pulmonary tuberculosis in sanatoria peculiar difficulties are encountered. The results of treatment differ in every case, according to the previous duration of illness, the age of the patient and the type of disease. The method of using a new treatment for alternate cases is not applicable, since some of the cases would be moribund and others so slight that rapid improvement might be expected with ordinary treatment. If any method of selection is used an imponderable error is introduced.

To eliminate the age factor we have put together the results of treatment in one age-group only, 16–26, during the past five years. This group contains the highest proportion of cases considered most suitable for chrysotherapy by all observers. Over the whole period one-third of the cases, and during the last three years, one-half have had gold in the form of Crysalbine, Allochrysine or Myocrysine in the usual weekly doses of 0·1–0·5 g. for six to eight weeks, followed in many by a repeat course after an interval of six weeks. During the past three years those not treated with gold have been slight cases or cases with pleural effusion in whom the prognosis was very favourable without special treatment, or moribund cases. Taking the whole group into consideration, whether they have received gold treatment or not, an improvement in the results of a five years' working should be evident if gold were of any value, compared with a similar control group in the previous five years, other factors being equal. The number of cases treated by artificial pneumothorax are approximately equal in both groups. Dr. C. J. C. Faill, the tuberculosis officer who is responsible for allocating cases to our institution, informs us that the cases sent to us have been chosen on the same basis during the whole ten years—another institution receiving the majority of the earlier cases.

TABLE I.—*Pulmonary Tuberculosis in Bristol* (Age-group 15–25)

Year.	Notifications.	Deaths.	Percentage of deaths to notifications.
1925	195	121	62
1926	186	133	68
1927	175	143	81
1928	177	123	69
1929	153	90	58
1930	159	89	55
1931	161	86	53
1932	129	53	41
1933	163	78	48
1934	132	54	41

Where the test and control series are not contemporary one has to consider the trend of mortality of the disease in the area from which the cases are drawn. Prof. R. H. Parry has kindly provided us with the figures of notifications and deaths in an almost identical age-group, 15–25, in Bristol during this ten years (Table I.). From these it is evident that while the number of notifications is diminishing, the percentage of deaths to notifications is decreasing more rapidly, which suggests that the disease is becoming less fatal in this age-group in Bristol. This factor should show itself in our figures in an improvement in the results.

TABLE II.—*Control Group* (1925–29) *Before Use of Gold* (Age-group 16–26)

—	Died.	Worse.	Non-quiescent (improved).	Quiescent.	Total.
1925–29 ..	104	62	177	147	490
Percentages	21·224	12·653	36·122	30	—

On comparing the test and control groups (Tables II. and III.) it will be observed that the differences in the results of treatment in the two series are statistically negligible whether based on the whole five years during which one-third of the cases received gold or in the last three years when one-half of the cases had gold. One can only conclude that gold treatment is of no appreciable value.

TABLE III.—*Test Group Treated with Gold* (1930–34) (Age-group 16–26)

—	Died.		Worse.		Non-quiescent (improved).		Quiescent.		Total.	
	Gold	No gold	Gold	No gold	Gold	No gold	Gold	No gold	Gold	No gold
1930–34	35	108	21	35	63	71	52	107	171	321
	143		56		134		159		492	
Percentage results.	29·07		11·3		27·2		32·3		—	
1932–34	26	53	13	18	58	28	50	53	147	152
	79		31		86		103		299	
Percentage results 1932–34 only.	26·4		10·3		28·7		34·4		—	

The examination of our statistical results has been a painful shock, for we were convinced whilst carrying out this costly method of treatment that in chrysotherapy we had found a valuable aid; many of the cases seemed to do extremely well. But one tends to forget that many cases previously did extremely well even without gold. It is to us a sad reminder of the extreme fallibility of clinical judgment when exposed to the cruel light of a controlled statistical inquiry on a large number of cases.

POST-OPERATIVE INTRACRANIAL THROMBOSIS IN CHILDHOOD

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INTRACRANIAL thrombosis may occur in children, as in adults, after local operations for conditions such as mastoiditis; but intracranial complications following two operations so different as herniotomy and the extraction of teeth stimulates search for other cases.

Schwenninger[1] in 1910 stated that classical thrombophlebitis after operation was never seen before puberty—unlike septicæmic thrombophlebitis, which attacks infants. Schnietzler[2] agreed with him. Schwenninger's statement, however, was too sweeping, though he brought out the useful distinction between septicæmic and non-septicæmic cases. Case 5, of the series here described, exhibits a classical, but not a fatal, pulmonary embolism. The records of about 11,500 post-mortem examinations made at the Hospital for Sick Children, Great Ormond-street, between 1860 and 1934, contain only one other case of post-operative pulmonary embolism, but there were two septicæmic intracranial thromboses, both following operations for cleft palate. There were also three cases of intracranial thrombosis after "clean" operations, two of them herniotomies, the other Loreta's operation for pyloric stenosis. In two further cases there was infection at the site of operation, but septicæmia was not demonstrated. In another there was septicæmia, but it was probably due to septic thrombosis. All occurred in this century, the age of major surgery. The superior longitudinal sinus was most commonly affected (5 out of 8 cases).

Little attention has been paid to this complication of pædiatric surgery: Byers and Hass[3] mention three cases but give no details; Wyllie[4] recognises the occurrence, and there is a good short account in Garrod, Batten, Thursfield, and Paterson's text-book,[5] in which three of the cases described here are instanced.

SEPTICÆMIC CASES

The first type then is the septicæmic, illustrated by the following:—

CASE 1.—A girl, aged 2 years, was admitted to the Hospital for Sick Children under Mr. Collier on March 2nd, 1910, for repair of a cleft palate which had been operated on eighteen months before. On March 4th a flap operation was performed. In the evening the patient vomited and collapsed. Two days later the temperature was 104°, tremor of the arms and legs was noted, the knee-jerks were present, ankle-clonus could be elicited, there was paralysis of the right internal rectus muscle. Next day the child was drowsy, temperature remained high, and she died on the 9th.

Post mortem, the superior longitudinal sinus was found to contain pale clot, and the parietal and temporal cortex was congested and œdematous. There were petechial hæmorrhages under the pleura of the collapsed lower lobe of the left lung; the endocardium was stained a brick red; the liver was large and fatty; the spleen large and semi-diffluent. Post-mortem culture of the heart's blood produced streptococci.

This demonstrates the fairly early affection of the motor areas, which Byers and Hass found usual, due to interference with their venous drainage by clotting in the superior longitudinal sinus. Case 4 also shows this.

CASE 2.—A boy, aged 3 years and 7 months, was admitted to hospital under Mr. Barrington-Ward on Jan. 23rd, 1931, for repair of a cleft palate which had been operated on three months before. On Jan. 28th it was resutured, but by Feb. 3rd it had again broken down. Three days later the temperature was high, there were signs of pharyngitis and bronchitis. Subsequently the temperature swung between 102° and 104°. On the 17th blood culture produced a pure growth of hæmolytic streptococci and death occurred a few hours later. The autopsy disclosed ante-mortem clotting at each end of the superior longitudinal sinus, and in some of the veins leading to it. There was no staining of the endocardium, the liver and kidneys were very pale, the spleen large and diffluent.

Symptoms of the thrombosis were in this case masked by the general infection. Thrombosis was not due to local infection from the palate, for the superior longitudinal sinus only was affected, and it seems probable that it was secondary to the septicæmia.

In the next case to be described there was also a wound infection (streptococcal). The state of the liver and the spleen, the absence of any recorded neurological signs, and the desperate illness of the child, indicate that intense toxæmia or septicæmia was the important factor.

CASE 3.—A boy, aged 2 years and 7 months, was admitted on Oct. 26th, 1909, with megacolon. On the 29th Sir Arbuthnot Lane removed one foot of the sigmoid colon, and the child did well until Nov. 3rd, when the pulse became quick in the afternoon, and in the evening the patient suddenly collapsed and became cyanosed. The lower part of the wound was opened, turbid serum escaped, from which streptococci were cultured. He became weaker and died on Nov. 5th. His temperature was never raised above 101°.

Post mortem the operation wound appeared healthy. The superior longitudinal sinus and its tributary veins were thrombosed, but the other sinuses were not affected. The brain substance around the affected vessels was soft and deeply congested. The middle ears were dry. There was consolidation of the posterior portions of the lower lobes of both lungs. There was no free fluid in the abdomen, the bowel anastomosis was covered with lymph and appeared healthy. The large intestine was enormously dilated, the small normal. There were fatty changes in the liver, and the spleen was enlarged and friable.

CASES WITHOUT SEPTICÆMIA

Of the next four cases, which were non-septicæmic, two followed herniotomy (as also did the isolated case of fatal pulmonary embolism, which is not described here). It is difficult to believe that this is merely accidental; it is indeed what might be expected. The great rarity of classical thrombophlebitis following operation in children must be partly due to the fact that the operations performed on them differ from those performed on adults. It most frequently occurs after myomectomy, hysterectomy for uterine cancer (Chauvin[6]), and prostatectomy (Wilson[7]). The child is, at present, immune from surgical assault on uterus and prostate. But Chauvin's figures show that there is one other operation after which venous complications are at all common—this is herniotomy—an operation often performed in youth.

CASE 4.—A boy, aged 4 years, was admitted to hospital on Feb. 9th, 1911, under Mr. Corner, for radical cure of bilateral inguinal hernia, which was performed on the 10th. Next day the child "became more or less mad"; he shouted frequently, his eyes were fixed and staring. On the day after that he was convulsed, especially on the right side. He had another fit, this time bilateral, on Feb. 13th; his temperature rose to 107° F., and he died early on the morning of the 14th.

At autopsy a small firm thrombus was found towards the anterior end of the superior longitudinal sinus; there was a small extravasation of blood over the front of the left parietal lobe; many of the capillaries in the Rolandic areas were thrombosed. There was a little muco-pus in both middle ears. All lobes of the lungs contained patches of consolidation. The peritoneum in the right internal inguinal opening showed some congestion; the wound was healthy.

CASE 5.—A girl, aged 3 years and 3 months, was admitted to hospital on May 18th, 1934, under Mr. Higgins, for cure of a left inguinal hernia. She was almost blind, having congenital dislocation of both lenses. On May 28th radical cure was performed. On the following day she had sudden dyspnœa and cyanosis, with a weak pulse. Three days after operation she developed a left hemiplegia, with a left facial paralysis; the left plantar reflex was extensor. The cerebro-spinal fluid was normal, the blood-urea 26 mg. per 100 c.cm. On the 9th day her condition was still poor; she was transferred to a medical ward under Dr. Cockayne.

At this time she resented examination; her pupils reacted inconstantly to light but were equal; iridodonesis was present in both eyes. The discs were not seen owing to the abnormal position of the lenses. Both abdominal reflexes were absent, both knee- and both ankle-jerks present, the left plantar reflex extensor, the right flexor. There was difficulty in looking to the right with both eyes, slight weakness of the muscles supplied by the 5th and 7th cranial nerves on the left side, and complete paralysis of the left arm and leg. The operation wound was healthy.

On the 18th day there was some recovery of power, and the girl could speak a little ("Mummy make it better," &c.). But on the following morning she could not be waked. She was in fairly deep coma, but opening the mouth was strongly resisted; flexion of the left knee occurred spontaneously during examination. The pupils were fixed, the right being dilated, the left contracted; there was a divergent squint; face normal, eyes shut; left arm and leg as before; right arm and leg paralysed and limp. Respiration was slow and regular; pulse-rate 140. Both corneal reflexes were present, the left being more active than the right. Abdominal reflexes could not be obtained, both plantars were extensor, knee- and ankle-jerks were absent. The cerebro-spinal fluid was normal.

In the evening the pulse-rate was 60, the patient vomited, and convulsions limited to the left arm and leg occurred. There was a similar attack the next day; early in the morning of the 21st day after operation she died.

At post-mortem examination a dark red consolidated area was seen at the base of the lower lobe of the left lung; on section firm clot projected from smaller and larger vessels, and the consolidation was seen to extend 3–4 cm. into the lung. On microscopical examination all the larger vessels were seen to contain adherent thrombi. There was no appearance of infection. Firm clot was also present in the basilar artery and the circle of Willis, in the left internal jugular vein, and the lateral sinus. There was very extensive softening of the whole of the right cerebral hemisphere, the thalamus and base being more affected than the parietal and occipital cortex; there were numerous pin-point hæmorrhages throughout. An old subarachnoid hæmorrhage involved the right temporoparietal region. The left hemisphere showed no necrosis or hæmorrhage. The hernia wound was clean; the inguinal vessels contained no thrombus (3 hours after death). The liver was engorged, with paler areas of fatty change, the other organs normal.

This child had sufficiently clear-cut signs to permit a tolerably accurate diagnosis (during life) of pulmonary embolism, followed two days later by embolism or thrombosis on the right side of the brain, and two weeks later by similar affection of the left side. The absence of convulsions until two days before death is interesting but not surprising, for the superior longitudinal sinus was not involved.

CASE 6.—A boy, aged 9 weeks, was admitted to hospital in a very wasted condition on August 26th, 1908, under Dr. Colman, with symptoms of pyloric stenosis for the previous six weeks. On August 28th Mr. Waugh incised the stomach and dilated the pyloric canal with Hegar's dilators. A little diarrhœa and vomiting followed the operation, but had ceased by Sept. 3rd. On Sept. 11th marked head retraction was noticed; blood-stained, sterile, cerebro-spinal fluid was withdrawn by lumbar puncture. Death occurred next day.

Post mortem the superior longitudinal sinus was found to contain firm, slightly adherent clot; the contributory veins were thrombosed. On the surface of the brain was effused blood, on the left side the corpus striatum, and the internal capsule were softened and contained small areas of hæmorrhage. There was muco-pus in both ears; the tympanic membranes were normal. The pylorus was much hypertrophied, the incision into the stomach had healed, there was a little plastic peritonitis, the adhesions being easily broken down, the other organs normal.

This case has been previously mentioned by Sheldon.[8] He considers it as one of the marantic class, but it is difficult to understand why thrombosis should have occurred about a week (probably) after a successful operation for the relief of the condition.

CASE 7.—A. S., aged 1 month, was admitted to hospital under Sir Arbuthnot Lane, on April 15th, 1909. He was a well-nourished boy with a double hare-lip and cleft palate. An operation was performed on the 16th, but by the 22nd the flap had almost completely broken down. On the 25th he was very ill; on May 3rd he died.

The post-mortem examination revealed a small cerebral hæmorrhage at the posterior part of the upper frontal convolution on the right side; the superficial veins in the immediate vicinity showed thrombosis. There was pus in the right middle ear. There was clear fluid in the serous cavities, œdema of both lungs and consolidation in the upper part of the right lower lobe; the liver was firm, the spleen not enlarged, the other organs normal.

Thrombosis in this case was very limited, and its position does not suggest spread from the infected wound. There was no evidence of septicæmia, as there was in the other palate cases, but it is not immediately obvious what killed this child.

It is difficult to know why these non-septic thromboses occur. In Case 5 intracranial clotting was probably due to embolism. No cause appears in cases 4, 6, and 7. In Case 4 death took place soon after the operation, and a falling blood pressure with surgical shock may have caused complete stasis in the rigid sinuses, which cannot contract to compensate for a small flow of blood. But something more than stasis is needed to produce intra-vitam clotting.

Intravenous therapy has been suggested as a cause, but there is no record of anything being given to any of the uninfected cases by the intravenous route. Trendelenburg's position has also been accused, but it is unlikely to have been used in these cases.

AN UNCLASSIFIED CASE

CASE 8.—A girl, aged 3 years and 8 months, was admitted to hospital on Dec. 4th, 1934, under Dr. Pearson. Two weeks previously the first and second left *lower* molar teeth had been extracted, under ethyl chloride and ether anæsthesia. Since then she had had a cold in the head. Four days before admission she had a frontal headache, without pyrexia.

On admission she had a temperature of 102°, and was delirious. There was œdema of both eyelids, more marked on the left, slight œdema of the forehead, and blueness of the middle of the forehead, the lower eyelids, the nose and the philtrum. The median frontal vein was firm and thickened. There was bilateral proptosis. The Vth left cranial nerve was paralysed, the right nerve was less affected. Kernig's sign was positive, and there was some neck rigidity, but no other neurological abnormality, except haziness of the nasal side of the left optic disc. The tongue was dirty and dry, the sockets of the first and second left lower molars contained yellow exudate. A few teeth were carious, the tonsils were not enlarged, but there was a post-nasal discharge and blood and pus were seen in the left nostril. There was no tenderness over the frontal and maxillary air sinuses, and no definite abnormality was seen in an antero-posterior radiogram of the skull. On Dec. 5th there were 25,000 white cells per c.mm. of blood; 92 per cent. were polymorphonuclear. The cerebrospinal fluid was turbid and blood-stained, and contained albumin 0·4 per cent., chlorides 0·68 per cent., no sugar, and 560 cells per c.mm., of which 94 per cent. were polymorphonuclear; no tubercle bacilli were seen, and the fluid was sterile on culture. Blood culture gave a growth of *Staphylococcus aureus* in two days. The temperature continued to vary between 101° and 104°, and the child died on Dec. 15th.

Post mortem the thrombosed middle and left frontal veins were prominent, and small thrombosed veins were visible over the bridge of the nose and external to the left eye. There was bilateral proptosis, and there were many small abscesses in the left eyelid.

The nose was examined from above, no septic focus was seen in it, or in the mastoids, the middle ears, or the jaws. The body of the sphenoid bone was largely eroded, and contained a drachm of thick pus. Both cavernous and both intercavernous sinuses were distended by septic thrombus breaking down into greenish-white pus. Pus extended into the left orbit, and the ophthalmic veins on both sides were thrombosed. The superior longitudinal sinus contained post mortem clot; the other venous sinuses, and the internal jugular vein, the vein of Galen, and the superficial vessels of the cortex contained fluid blood. The base of the brain was covered with thick adherent pus, yellow lymph, and friable blood clot; blood also covered the spinal cord as low as the sixth cervical vertebra.

The lungs contained very many small abscesses, containing thick pus and altered blood; there were many pyæmic abscesses also in the kidneys. The other organs presented no striking abnormalities, except that there was advanced fatty degeneration of the liver. *Staphylococcus aureus* was grown from the pus at the base of the brain, in the cavernous sinuses, and in the orbit.

This case does not fit into the categories mentioned. It was not an uninfected case, nor was it due to direct spread from the site of operation, as in mastoid cases. It was septicæmic, but the history suggests that there was a local lesion before the septicæmia. There may have been a sphenoidal sinusitis, followed by sphenoidal osteomyelitis, cavernous sinus thrombosis, and subsequent pyæmia. If so, it is possible that the anæsthetic was the match that fired the train.

DIAGNOSIS

Signs and symptoms vary as the position of the lesion varies, and are modified by the condition of the patient; they may be masked by severe infection. The commonest site is the superior longitudinal sinus, usually the middle portion (Byers and Hass[3]), so that venous congestion of the cerebral cortex, especially the Rolandic areas, occurs early, and is followed by thrombosis. . Consequently motor symptoms are frequent, in post-operative and other cases. Later, softening of the brain occurs and hæmorrhage takes place, giving further symptoms. Drowsiness and vomiting are common, though in Case 4 there was extreme excitement.

Untoward signs, in these cases were first noticed at intervals varying from a few hours to two weeks after the operation, and there was no significant difference in this respect between infected and uninfected cases.

SUMMARY

Post-operative intracranial thrombosis occurs rarely in childhood, except as a local complication of mastoiditis. It occurs in septicæmia (usually streptococcal); possibly in toxæmia; by local spread from an infected air sinus; and in uninfected cases. Six cases from post-mortem records, and two personally observed, are described. Four of the operations were abdominal (2 herniotomies) and 4 were buccal (3 cleft palates). Three of the latter and only one of the former group were infected. The superior longitudinal sinus was the most frequently involved (5 cases).

My thanks are due to the surgeons and physicians named for permission to describe their cases, to the medical staff of the Hospital for Sick Children for permission to use the post-mortem records, and to Dr. R. W. B. Ellis for advice and help.

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FAT NECROSIS ASSOCIATED WITH PERFORATED DUODENAL ULCER

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Fat necrosis of the omentum and mesentery is so constantly associated with acute pancreatitis that many surgeons accept its discovery at operation as conclusive evidence of acute inflammation of the pancreas. The condition has been found, however, in connexion with acute perforation of a duodenal ulcer,[1] and also in cases of perforation and rupture of the small intestine,[2] as well as in a case where the cause was not discovered [3] (though the possibility of a leaking duodenal ulcer in this particular case was not excluded). In all of these cases the pancreas was found to be unaffected. While it is clear, then, that acute pancreatitis is responsible for most cases of fat necrosis, it is evident that there are many other conditions which produce it, and hasty inference must not be drawn from its presence. Furthermore, it is to be noted that in acute pancreatitis the peritoneal exudate is blood-stained, a factor which is helpful in arriving at the diagnosis before actual examination of the pancreas. To quote Lord Moynihan, "Whatever doubts may have been previously felt as to the nature of the disease, they are at once resolved when these two conditions, fat necrosis and sanguineous exudate, are found."[4]

The association of fat necrosis with perforation of a duodenal ulcer is rare, if we are to judge by published records; but I believe it is not unusual to find at autopsy small areas of fat necrosis near the site of perforated duodenal and perforated gastrojejunal ulcers.[5] Why this should be so is not clear, particularly as the condition is so seldom found at operation. A short review of the factors involved in producing fat necrosis may help to suggest an explanation.

Fat necrosis of omentum and mesentery is due to the action of two ferments, trypsin and steapsin, contained in the pancreatic juice. Steapsin splits the fat into fatty acids and glycerin, and the fatty acids combine with calcium salts to form calcium soap. It appears that this action can only take place after the death of the cell, caused by trypsin. Again, the extent of the conversion is governed by the activity of the pancreatic secretion, which is variable and dependent upon its content of trypsinogen and steapsin, and on the conversion of trypsinogen into trypsin. It is possible, then, for pancreatic secretion to escape into the abdominal cavity and cause little or no fat necrosis, though such a result is unlikely. In typical cases of acute pancreatitis, the condition shows itself as small white patches of fat necrosis dotted here and there over the omentum and mesentery, the patches being roughly round in shape and not more than a few mm. in diameter, unless by chance some of them coalesce to a larger size. In the early stages they are confined to the tissues of the lesser sac, but later they may be found widespread throughout the abdomen and in the subperitoneal fat. They have been found post mortem in the subpleural, subpericardial, and subcutaneous tissues, and even in the medulla of bones—such remote complications being explained by absorption of pancreatic ferments into the lymphatic and general circulation, as well as by actual embolism of pancreatic cells.[6]

Under normal circumstances, trypsinogen is converted into trypsin by the action of the enterokinase of the small intestine, and it may be asked how this conversion is brought about in cases of acute pancreatitis. Mellanby and Woolley (quoted by Walton)[6] have shown that *Bacillus coli* and other organisms are as capable of bringing about conversion of trypsinogen into trypsin as enterokinase. In fact one of the explanations of the acute fulminating condition which develops in the pancreas is that trypsinogen is converted into trypsin by micro-organisms which have gained a footing in the pancreas, and that trypsin then proceeds to digest the pancreatic cells themselves. In any event the eruption in the pancreas is so great that the escape of pancreatic secretion from the grossly damaged pancreas is inevitable and no doubt profuse, and, as we have seen, if allowed time to develop will have widespread effects.

In cases of perforation of duodenum and intestine the escape of pancreatic secretion is not so assured. Here much will depend upon the amount of free or unutilised pancreatic secretion in the bowel at the time of perforation, and also on the proximity of such secretion to the site of perforation; for we may take it that following the shock of perforation, the normal function of the pancreas and its ducts, as well as that of the duodenum and intestine, will be in abeyance. When one considers that fat necrosis is found occasionally, post mortem, in cases of perforated duodenal and gastrojejunal ulcers, and that it is seldom found at operation, it seems likely that operation is undertaken before the condition of fat necrosis has had time to develop. In Richter's case of fat necrosis following the perforation of a duodenal ulcer, 28 hours had elapsed before the time of operation, and in the case recorded here the interval was 36 hours.

The patient, a barman aged 46, was admitted to the North Middlesex Hospital at 10 P.M. on July 21st, 1925. He was *very ill and unable to give much history*. The main facts were that about 11 A.M. on the previous day he was seized with acute abdominal pain and vomited. His doctor ordered medicine which was taken with relief. After one and a half days in bed, with only sips of water to relieve thirst, another doctor ordered his removal to hospital.

On admission the temperature was 101·4° F. and the pulse-rate 126. The abdomen was distended, tender and rigid; there was no movement on respiration. Laparotomy was performed through a right mid-abdominal paramedian incision. The peritoneum was found to be œdematous and the abdominal cavity flooded with seropurulent fluid. Fat necrosis of the omentum was at once apparent and the incision extended upwards. The pancreas proved to be normal to palpation but a perforation was discovered on the upper anterior surface of the first stage of the duodenum. This was closed and the abdomen drained.

The patient was admitted to the London Hospital three months later for investigation. Mr. James Sherren opened the abdomen through the scar of the previous operation and found the omentum adherent to the upper part of the abdominal wound. The adhesions were cleared. The omentum was otherwise normal in appearance and there was no sign of previous fat necroses. The site of the perforation of the duodenal ulcer was identified, and a small piece of unabsorbed catgut was found protruding from the surface of the duodenum. The pancreas, exposed through gastrocolic omentum, was normal to inspection and palpation. Posterior gastrojejunostomy was performed, and the patient was discharged from hospital towards the end of the third week. For ten years he has enjoyed excellent health; he now runs a grocer's shop and says he works 12 hours a day.

In this case the patches of fat necrosis were much larger than those usually seen in acute pancreatitis—some of them being more than an inch in diameter—and they were extensively distributed over the surface of a large and well-nourished omentum. Three months later, however, they had disappeared without trace. A portion of the omentum excised at the time of the first operation was examined by Dr. T. H. C. Benians, who described the specimen as one of "typical fat necrosis of the omentum."

I am grateful to Mr. Sherren for permission to publish the details of the second operation.

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A GIFT FOR RADIUM.—King Edward's Hospital Fund for London has received from Mr. Roger Parr a donation of £10,000 as a Jubilee gift to its radium fund. In 1929 Mr. Parr gave £10,000 towards the purchase of the stock of radium which the Fund places out on loan to hospitals. His present gift is to facilitate schemes which are at present being worked out by the King's Fund for increasing the usefulness of this radium.

A FATAL CASE OF ELECTROCUTION

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JELLINEK[1] in 1912 described the factors which play an important part in electrical accidents and drew attention to the influence of resistance, voltage, amperage, earth contact, and the mental condition of the victim at the moment of the shock. The traumatic results of electrocution are more or less governed by the path of the current, whether direct through the body or indirect over its surface. The effect of currents of high voltage on the nervous system has lately been described by Critchley[2] and Pritchard.[3]

A case is recorded below in which a healthy male succumbed to an alternating current of 590 volts despite prompt attempts at resuscitation. These cases of electrocution are as yet uncommon in this country.

A young engineer in an electricity works was found lying unconscious on the ground some three feet from the guarded switchboard controlling a rotary converter. His duties included the starting and running up of this motor, and on the day of the accident he was seen walking down the room to perform this act. Shortly afterwards a fellow mechanic discovered him lying on the ground and artificial respiration was instituted, within about ten minutes, on the assumption that the victim had received an electric shock. Unfortunately the man never recovered consciousness and he was removed to hospital dead. Artificial respiration had continued for about 55 minutes.

POST-MORTEM FINDINGS

Autopsy was performed six hours after death, and a further examination twenty-four hours after death. The body was that of a young well-built and well-nourished male; height 5 ft. 10 in., and weight 12 st. approximately. Post-mortem lividity was well marked on the lower (dorsal) aspect; the features were congested and the superficial temperature of the body was still perceptible to the hand, although a clinical thermometer failed to register it.

Eyes.—The pupils were dilated, and running horizontally across the cornea and sclera of both eyes was a linear scar. The sclerotic of the right eye showed two hæmorrhages, medial and lateral, and the left sclerotic, one on the lateral aspect, in a line with the scars. The index-finger and thumb of each hand showed recent burns and these wounds demonstrated the points of contact, and that the victim must have grasped the live points firmly between the fingers and thumbs.

Right hand.—A small wound on the middle phalanx of the index-finger, and on the radial side of that finger there was an elongated lacerated wound which ran obliquely downwards from back to front and showed signs of blistering and charring. On the dorsum of the same finger there was a small circular char, similar in appearance to the burn caused by a lighted match head which has stuck to the skin after striking. On the thumb of the right hand a small linear scar ran longitudinally from the tip.

Left hand.—On the radio palmar aspect of the distal phalanx of the thumb there was a small triangular burn with a depressed centre. The index-finger showed an elongated wound similar to that of the right hand with the same characteristics (Fig. 1).

Examination of the *hands and forearms* showed a definite pale area of the skin extending from the thumbs and index-fingers and tapering down to a point towards the elbows. Externally there was no other evidence of injury.

Brain.—The dura mater showed numerous petechial hæmorrhages throughout the surface and towards the base of the skull there was a definite congestion of the blood-vessels and extravasation of blood. On the brain surface the sulci were marked by petechial hæmorrhages except one area at the superior extremity of the right fissure of Rolando, which by contrast was very pale.

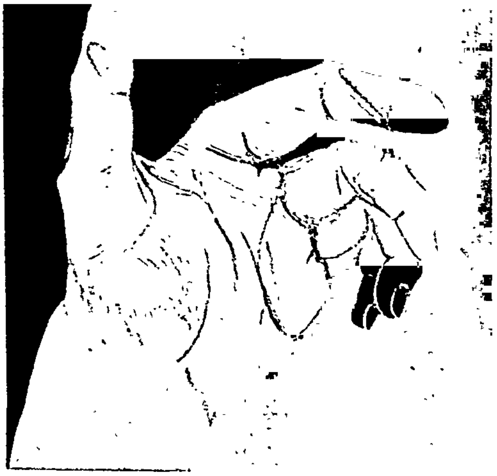

FIG. 1.—Sketch of left hand showing burns of thumb and forefinger.

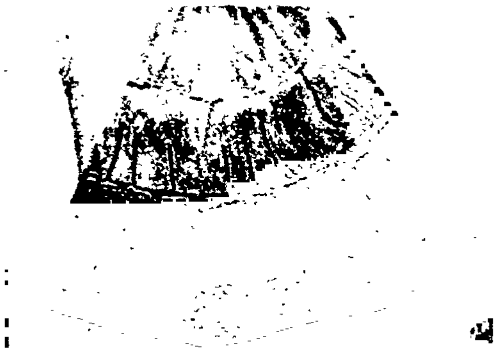

FIG. 2.—Section of loop of small bowel showing prominent lacteals and patch.

Further examination of this area revealed that the pia mater and the arachnoid had been stripped off the underlying brain tissue. At the anterior extremity of the second frontal convolution, right lobe, there was a small superficial hæmorrhage about the size of a sixpenny piece. No laceration nor evidence of disease of the brain tissue was found.

In the region of the *neck* there was marked congestion of the muscles and tissues. Tongue, trachea, and œsophagus were healthy but congested.

Thorax.—There were no adhesions between the pleural surfaces. The lungs were ballooned and mottled, but the surface was light in colour. Petechial hæmorrhages were seen on the costal and interlobular aspects. Along the lateral borders of both lungs were several subpleural hæmatomata. The blood in these hæmatomata was still fluid some twenty-four hours after death. On section the lungs showed congestion but no evidence of disease. The pericardium was normal and healthy, with a small amount of clear fluid present in the sac. Several petechial hæmorrhages were seen. The myocardium was also healthy; both ventricles contained a very small amount of dark fluid blood. All valves were patent and normal. The endocardium showed one or two minute petechial hæmorrhages; otherwise healthy.

Abdomen.—The stomach was small, empty, and normal. The liver, spleen, and kidneys were congested but healthy. On section of the spleen the blood ran out freely. The coils of the small intestine showed two features of interest apart from the petechial hæmorrhages, viz.: (1) The pearly-white appearance of the lacteals, which stood out on the surface of the bowel and mesentery. As they emerged from the muscular layer, these lacteals ran longitudinally to anastomose in pairs forming a main trunk which turned upward into the mesentery for a distance of one inch before disappearing in the deeper layers. (2) At the most dependent portion of each loop of the small bowel there was a definite patch of congestion about one and a half inches long on the surface opposite the mesenteric attachment. Further examination of these patches showed an apparent thinning of the muscular layer and general loss of tone, compared with the rest of the bowel (Fig. 2).

Blood.—The usual condition of the blood after electrocution was conspicuous in this case; the fluidity was general and remained so for at least twenty-four hours after the autopsy. A blood film showed no abnormality.

Microscopic examination of the skin of these burnt areas showed a gap in the superficial layer and vacuolation in the stratum corneum which was separated from the deeper layers (Fig. 3). In the centre of the burn, the structure of the stratum Malpighii was quite effaced, and the subjacent cellular tissue had its cell nuclei distorted into threads (Fig. 4). The blanching of the skin between the index-fingers and thumbs demonstrated the superficial or indirect path of the current.

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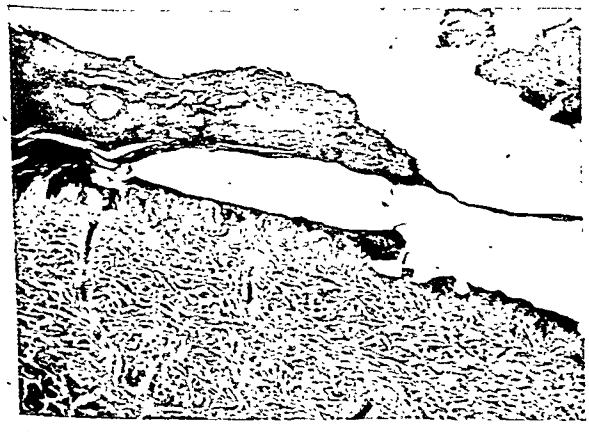

FIG. 3.—Low power. Section of skin through the burnt area. (× 45.)

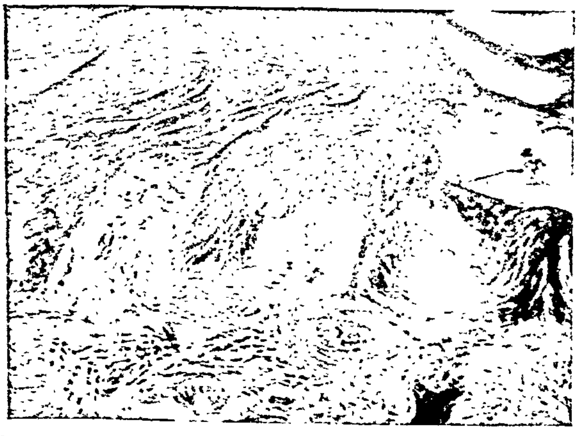

FIG. 4.—High power. Section of skin through the burnt area. (× 150.)

THE INCIDENCE OF PROCTITIS IN GONORRHŒA OF FEMALES

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Gonococcal infection of the rectum as a complication of gonorrhœa in women does not appear to have attracted much attention in this country, and probably if the medical officers of our venereal disease treatment centres were asked to state their opinion as to its incidence, most of them would declare it to be negligible. The reason is that in the great majority of cases the condition causes practically no clinical sign or symptom. In this respect we may say at once that our experience coincides exactly with that of C. L. Martin,[1] whose paper appeared whilst we were collating the results of the investigation reported here.

Our attention was drawn to the subject of gonococcal proctitis a few years ago by Dr. Vuletic, of Prague. During a visit to the V.D. Department, St. Thomas's Hospital, Dr. Vuletic said that in continental clinics it had been found to be a very common complication of gonorrhœa in females. Our scepticism about its frequency in this country was met by Dr. Vuletic's suggestion that laboratory tests of rectal secretion might lead to a different opinion, and a small series of specimens taken then showed us that in this matter we had been in a fool's paradise. Some months later we commenced a systematic investigation to ascertain the incidence of proctitis in our female patients with gonorrhœa, and the results are reported below.

The cases comprising the present series are a random sample, in that one of us (P. A. C.) whenever an opportunity occurred took specimens from the rectum of any female under examination on first attendance, or under treatment for gonorrhœa, or undergoing tests of cure following treatment for gonorrhœa.

METHOD OF INVESTIGATION

The procedure was as follows:—

Collection of Material.—After external cleansing and insertion of a plug into the vagina to prevent any possibility of contamination with vulvovaginal secretion, a well-made platinum loop was passed through the anal canal in such a way as to rub along the anterior wall of the rectum, from which the specimen was collected. In the majority of cases (37 out of 69 that showed the presence of gonococci) the loop collected no visible secretion; in 8 it collected obvious pus, and in 22 only a mucoid secretion. On withdrawal a smear of the secretion was made on a microscope slide which was stained by Jensen's modification of Gram's method. Another specimen was immediately spread on the culture medium which in our experience has been found most suitable for isolating the gonococcus in these circumstances.

Culture Medium.—In a search for the most suitable medium one of us (K. E. H.) had tried the following: (1) Hydrocele broth, pH 7·6, containing various quantities of telluric acid and/or brilliant green, as restrainers of growth of *B. coli*. (2) Broth containing various quantities of a highly potent anti-*B. coli* serum. (3) Slopes of hydrocele agar, pH 7·6 in tubes of 1 inch diameter and providing a surface area of about 3½ square inches. (4) The same medium in Petri dishes providing a surface area of about 9½ square inches. Of all these the two first were useless and the last proved by far the most satisfactory; it was therefore employed in all the cases composing the present series.

In inoculating the plated medium the charged loop was made to draw series of closely set parallel lines in one direction and then a similar series at right angles to the first. Incubation was carried out at 37° C. for 48 hours, the plates being inverted to prevent water of condensation falling on the medium.

Recognition of Gonococci.—In preliminary detection of colonies of gonococci use was made of the oxidase reaction of J. W. McLeod and J. Gordon.[2] About 1 c.cm. of a 1 per cent. aqueous solution of dimethyl paraphenylene diamine hydrochloride was allowed to flow over the surface of the medium, the plate being slightly sloped to get rid of surplus reagent. After about five minutes smears were made from any pink colonies and stained by Jensen's modification of Gram's method. A diagnosis of gonococci was made on the strength of the organism being Gram-negative and having the morphological characteristics of gonococci. In positive cases the number of colonies varied from one (in several instances) to uncountable and giving the appearance of a pure culture (in two instances).

With regard to the question whether or not it is an advantage to employ both slide and culture the following were the results of 240 parallel tests. In 42 (17·5 per cent.) both smear and culture were positive; in 28 (11·7 per cent.) only the culture was positive; and in 11 (4·5 per cent.) only the smear. The employment of both methods therefore resulted in gonococci being discovered by one or both in 81 (33·7 per cent.) of the cases as compared with 29·2 per cent. if only cultures had been used and 22 per cent. if only slides.

RESULTS

The number of cases investigated in this way was 160. Their condition on first attendance at the clinic had been as follows:—

Category.	Description.	
(G.1)	With gonorrhœa of less than two weeks' duration ..	46
(G.2)	,, ,, ,, 2 to 4 ,, ,, ..	19
(G.3)	,, ,, ,, 4 to 52 ,, ,, ..	59
(G.4)	,, ,, ,, more than one year's ,, ..	4
(G.5)	With a history of gonorrhœa but no present bacteriological evidence of it	11
(N.V.)*	With no evidence of venereal disease	21

* This category for the purpose of this paper includes a few syphilis cases.

The cases were examined at various times after first attendance as shown in the Table. The figures in this Table relate to the results of the first examination of the rectal secretions and therefore represent a minimal incidence in the material examined.

Table showing the number of months after first attendance when the rectal examination was carried out, and the results

Category on first attendance.	No. of cases.	Examination of rectal secretion carried out							
		On first attendance		After first attendance during					
				1st month.		2nd to 5th month.		6th month or later.	
		Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
G.1 ..	46	2	2	4	2	14	13	2	7
G.2 ..	19	1	1	6	3	2	4	1	1
G.3 ..	59	7	9	16	2	11	11	1	2
G.4 ..	4	1	1	0	0	0	0	1	1

The Table shows that in 128 cases with evidence in slide and/or culture of gonorrhœa 69 were found by the same methods of examination to be suffering from gonorrhœal proctitis. In only 2 of these cases did the patient complain of any local discomfort, and in only 8 was there any sign of purulent discharge. In 8 of the positive cases the patients were under observation and tests of cure after treatment for gonorrhœa of the genito-urinary passages, and neither at the time of the rectal examination nor later showed gonococci in the urethral or cervical secretions. These patients would therefore have been discharged as cured but for the rectal examination.

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[1] Jour. Amer. Med. Assoc., 1935, civ., 192.

[2] Jour. Path. and Bact., 1928, xxxi., 185.

In 7 cases gonococci were never at any time found elsewhere than in the rectum. Salient points in these cases were as follows:—

1. Pregnant; sent for examination on account of a Bartholin abscess, and to be tested for fitness for admission to a maternity home; gonococcal complement-fixation reaction ++ (1/1).
2. Sent for examination because husband suffering from gonorrhœal rheumatism; complement-fixation reaction ++ (1/5).
3. Husband suffering from gonorrhœa; gonococcal complement-fixation reaction negative.
4. Sent by consort who had gonorrhœa of seven days' duration; gonococcal complement-fixation reaction ++ (1/5).
5. Attended with secondary syphilis; gonococcal complement-fixation reaction ++ (1/1).
6. History of treatment for gonorrhœa in another clinic; complement-fixation reaction ±.
7. Contact under treatment for acute attack; complement-fixation reaction negative.

In 5 of these cases the positive complement fixation would probably have prevented discharge of the cases, but in the remaining 2 only the rectal examination discovered the infection.

TREATMENT

In 10 cases nothing was done locally, and examination repeated from one to seven months afterwards gave a negative result in only 1. Most of the cases were treated at first by irrigation with potassium permanganate, 1/4000 to 1/8000, but this proved very disappointing, the majority of the patients being found to be still infected after from one to five months of such treatment. On the other hand, irrigation with acriflavine 1/5000 seemed as a rule to be effective usually within about a month; though further observation will be needed to determine in what proportion of these cases the infection has really been eradicated.

SUMMARY

(1) Of 160 cases suffering from gonorrhœa of the genito-urinary passages, or under tests of cure, or under suspicion, gonococci were found in the rectal secretion of 69. (2) In the great majority obvious signs and symptoms were absent. (3) By cultural methods an important proportion of cases are discovered which would be overlooked if tested only by smear on microscopic slide. (4) In 8 cases under test of cure gonococci were not found in the secretions of urethra and cervix either at the time of the rectal examination or later. (5) In 7 other cases examined under suspicion for one reason or other no gonococci were ever found in secretions from the genito-urinary passages. (6) Gonorrhœal proctitis does not appear to be self-limited; treatment by irrigation with potassium permanganate proved disappointing, but acriflavine 1/5000 seemed satisfactory. (7) Microscopical and cultural examination of the rectal secretion is clearly required for every female in whom there is any question of a gonococcal infection.

We wish to thank Colonel L. W. Harrison, director of the department, for permission to publish this paper.

THE ERYTHROCYTE SEDIMENTATION-RATE

A COMPARISON OF THE METHODS COMMONLY EMPLOYED FOR ITS DETERMINATION

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The estimation of the sedimentation-rate of the erythrocytes is firmly established as a valuable index of progress in certain diseases—notably pulmonary tuberculosis. Three methods of estimation are in general use at the present time: the Westergren method, the modified method of Zeckwer and Goodell, and the "micro-method." Reports on the sedimentation-rate are apt to perplex the practitioner, since often they do not state the method employed, the duration of the test, and whether the red cells or the plasma are measured. For example, the report may read "the red cells drop 26 mm.," or "sedimentation-rate 8·7," or "blood sedimentation-rate 13 per cent." The first report (26 mm.) indicates that the test has been performed by the Westergren method, and that the one-hour reading is plasma 26 mm. and red cells 174 mm. The figure 8·7 means the test has been carried out by the modified Zeckwer and Goodell method, and that the one-hour reading is red cells 8·7 parts, plasma 1·3 parts. The figure 13 per cent. is reached by a micro-method one-hour or half-hour reading, the plasma occupying 13 parts and the red cells 87 parts.

It is our purpose to describe briefly the three methods to show the relationship between them, and to indicate some advantages or disadvantages of each. A comparison of the three methods performed at the same time and under the same physical conditions was carried out on 10 patients at the Brompton Hospital, and the results are tabulated below.

The Westergren method,[1] a modification of the Fahraëus technique,[2] is performed in a glass tube 30 cm. long and 2·5 mm. in bore, graduated from below upwards from 0 to 200 mm. Blood is withdrawn from a vein, and mixed in a small test-tube with sodium citrate (3·8 per cent.) in the proportion of 4 parts of blood to 1 part of citrate solution. The citrated blood is then sucked up into the tube to the 200 mm. mark; the lower end is closed by inserting the tube into a rubber stopper, and the tube set perpendicularly in a stand. The reading is taken at the end of one and two hours, the column of clear fluid above the sedimented corpuscles being measured. A normal reading was considered by Westergren to be 3 mm. of clear fluid at the end of one hour. For purposes of comparison the reading can be given as a percentage by dividing it by 2, the result being expressed as mm. of supernatant fluid per cent.

The method used by us at the Brompton Hospital is a modification of that described by Zeckwer and Goodell.[3] The sedimentation tube has a bore of 0·75 cm., and it is marked in ten divisions each of 1 cm. Sodium citrate (3·8 per cent.) is placed in the tube to the 2 mark. About 5 c.cm. of blood is drawn from a vein, and ejected from the syringe into the tube containing the sodium citrate to the 10 mark. In this method the height of the column of sedimented corpuscles at the end of one and two hours is read in centimetres, and the tenths of a centimetre by placing a millimetre scale against the tube. The column of supernatant fluid is not recorded. A normal reading is 9·7 cm. of corpuscles in one hour. The reading can be made comparable with those of other methods by subtracting it from 10, and multiplying the result by 10, thus giving so many mm. of supernatant fluid per cent.

A third method is the "micro-method." The tube used is a capillary pipette of thick glass, about 6 in. long, whose bore is 1·13 mm., and graduated from above downwards in mm. from 1 to 100. The patient's finger is pricked, after warming it in hot water, and eight drops of blood are sucked into a special teated pipette; the blood is then mixed in a small test-tube with two drops of 3·8 per cent. sodium citrate solution. The citrated blood is then sucked into the capillary pipette to the mark 1, and the tube set in a water-bath at a temperature of 37° C. The reading of supernatant fluid is taken at the end of half an hour by some observers and at one hour by others. The final reading is expressed as so many mm. of supernatant fluid per cent. Normal readings are between 0·5 and 4·0 per cent. for men, and between 1 and 8 per cent. for women after half an hour.

Commenting on the three methods, we think that the Westergren method has the advantage that it or some modification of it is the most extensively used of all three, especially on the continent, and therefore the significance of its readings are more likely to be widely known. It is possibly more accurate than the modified Zeckwer method, since finer readings can be taken as a smaller column of blood is employed, but this does not seem to us an overwhelming advantage, the test being essentially a somewhat rough estimate of activity in pulmonary tuberculosis, and the value lying largely in the serial readings obtained in individual cases. The modified method of Zeckwer and Goodell has the great advantage of simplicity and it is sufficiently accurate for practical purposes. With regard to the "micro-method," the advantage would seem to be that it can be used when vein puncture is impossible. But the test is, in our opinion, not so easy to carry out, for it is sometimes difficult to obtain the requisite amount of blood by pricking the finger, and the technique is more complicated than in the other methods.

Table giving Comparison of Sedimentation-rates by Three Methods (after one hour)

—	Westergren method. 200 mm. tube.	Modified Zeckwer and Goodell method. 10 cm. tube.		Micro-method. 100 mm. tube.
	Plasma mm. (and mm. per cent.).	Corpuscles cm.	Plasma mm. per cent.	Plasma mm. per cent.
1	50 (25)	7·0	30	24
2	36 (18)	7·4	26	18
3	12 (6)	9·2	8	9
4	10 (5)	8·9	11	14
5	64 (32)	7·0	30	11
6	5 (2·5)	9·4	6	10
7	4 (2)	9·6	4	3
8	10 (5)	9·5	5	8
9	4 (2)	9·8	2	5
10	6 (3)	9·4	6	2

The Table shows that there is no constant discrepancy between the readings of the methods. The value of the sedimentation test lies in the comparison of readings, by the same method, from week to week, and whichever method is used, this is found to be a fairly good criterion of progress or retrogression. It would undoubtedly be an advantage if one method could be used universally; the test would then have more widespread significance.

References.—1. Westergreen, A.: Acta med. Scand., 1921, liv., 247. 2. Fahraëus, R.: Biochem. Zeits., 1918, lxxxix., 355. 3. Zeckwer, I. T. and Goodell, H.: Amer. Jour. Med. Sci., 1925, clxix., 209.

Clinical and Laboratory Notes

A CASE OF AGRANULOCYTOSIS

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The following case is reported to draw further attention to this condition, which is probably considerably commoner than is generally imagined.

The patient, a single woman aged 59, was admitted to the Hampstead General Hospital in December, 1934. On the day before admission she had noticed a small pimple on the lower lip just below the angle of the mouth on the left side; on admission there was a lesion about the size of a farthing in this situation, dark bluish-black in colour, and surrounded by moderate œdema and redness. The suspicion of anthrax arose and I was asked to examine it from this point of view. Material was scraped from the surface, a procedure which proved to be almost painless, and on examination revealed the presence, in pure state and considerable numbers, of a small actively motile Gram-negative bacillus.

The general condition at this time was good, though the temperature was 103·4° F. and the pulse-rate 120. There was no ulceration of the throat, but she was found to have a completely healed perforation of the palate; there was also a depressed scar over the left great trochanter. Apart from these two findings nothing of note was discovered. She stated that about nine months previously she had had a throat infection followed by an abscess in the thigh which had been treated at another hospital with complete recovery, her general health having subsequently been good.

The history obtained from this hospital was that she had been admitted with a severe membranous pharyngitis from which pneumococci had been grown and had later developed an abscess over the great trochanter, the infecting organism not being ascertained. Though gravely ill she had recovered but with a perforation of the palate and the scar we observed. The case had been regarded as obscure and no definite diagnosis was made.

That evening the local lesion was excised. Later in the evening the possibility of the case being one of agranulocytosis occurred to me and the following morning a leucocyte count revealed: white blood-cells, 1000 per c.mm., with no polymorphs or eosinophils, lymphocytes, 84 per cent.; and mononuclears, 16 per cent. The patient was now gravely ill. The excision wound showed a very remarkable appearance, with bluish-black necrotic tissue round the excision edge and outside this spreading œdema. The culture from the original lesion gave a pure growth of a motile Gram-negative bacillus producing a pink growth on ordinary agar; it subsequently proved to be a typical *B. prodigiosus*. A blood culture taken at the same time as the leucocyte count grew a pure culture of the same organism within twenty-four hours.

Pentnucleotide therapy was instituted as soon as the drug could be obtained; 20 c.cm. were given this day and again 20 c.cm. the following morning, on each occasion by the intramuscular route. A blood transfusion of 500 c.cm. plus citrate was given later on the same day as the first dose of pentnucleotide. On the following morning she was in extremis, an intravenous saline was administered, but she died about 2 P.M. The temperature was maintained between 101·5° and 104° F. during the course of the illness and the pulse-rate at 120, rising to 130 before death.

Histological examination of the tissue removed at operation showed a generalised necrobiosis of the epithelium, corium, and subjacent fat with practically no tissue reaction even at the edge of the necrotic area, what reaction there was being entirely mononuclear. The necrotic area was packed with Gram-negative bacilli.

At post-mortem examination the ordinary changes associated with septicæmia were well in evidence and the kidney and liver contained scattered collections of Gram-negative bacilli without tissue reaction round them. There were no polymorphs in the splenic pulp; the femoral marrow was chiefly fatty even in the head; the rib marrow was pink. In both femur and rib sections showed that red cell production was normal; but though some myeloblasts and myelocytes were found there were no formed polymorphs.

The points of interest in this case are: (1) the previous illness, which one may reasonably assume to have been agranulocytic angina, as the condition is known to be recurrent in some cases. If this opinion is correct a new cause of perforation of the palate is demonstrated. (2) The peculiar site of the lesion and the fact that where secondary infection was not so likely to occur as in the throat the infection was pure. The organism responsible is generally regarded non-pathogenic and of such restricted distribution that it is difficult to imagine how she came by it, particularly in pure state. This seems to dispose of any idea that any particular organism is associated with this disease and to demonstrate the importance of the "soil." The examination of the marrow supports the contention that the mechanism is a failure of maturation of the myelocyte comparable to the maturation failure in pernicious anæmia.

No history of the patient having taken amidopyrin in any form could be obtained; but the facts had to be got mainly from her relatives, her medical attendant, and her employer. When the diagnosis was made the patient was too ill to be able to fix her attention sufficiently to give a convincing answer.

THROMBOSIS OF THE ENTIRE AORTA

IN A WOMAN AGED TWENTY

By J. Gough, M.D. Wales

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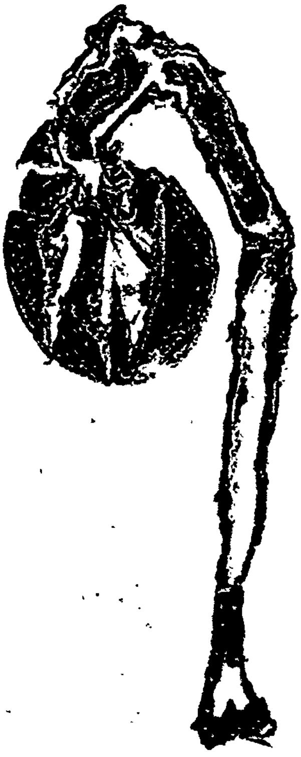
The following case is recorded because it showed the extremely unusual feature of a thrombus extending the whole length of the aorta.

Clinical History.—When admitted to hospital, eighteen weeks before death, the patient, a woman aged 20, had been suffering from dyspnœa and pain in the chest for eighteen months. She was found to have hypertrophy of the left ventricle without any apparent valvular lesion; the systolic blood pressure was 170 mm. Hg; the urine contained a large amount of albumin, together with blood-cells and fatty casts.

A hemiplegia occurred suddenly 10 weeks after admission to hospital, and there was gradual recovery from this. Eight weeks later there developed a sudden and complete flaccid paralysis of the lower limbs. The legs were at first completely white, but later they became bluish and showed large ecchymoses. There was complete loss of sensation in the lower limbs. On the following day the patient suffered severe abdominal pain and died some hours after passing a large quantity of blood per rectum.

Post-mortem Findings.—In the aorta, about half an inch above the valve, was found a shallow pouching toward the right side. On the outer aspect of this the pericardium was adherent. From this point a white and mixed fibrin thrombus extended the whole length of the vessel. In the arch and in the descending thoracic aorta the lumen was almost filled and only a narrow irregular channel was left for the passage of blood. Below the origin of the superior mesenteric artery it was completely obliterated. The thrombus in the arch was dense white and adherent, but below this it was mixed red and white and much less adherent. The aortic wall showed extensive calcification.

The heart was slightly enlarged and showed hypertrophy and some dilatation of both ventricles. The valves were quite normal. There was a layer of antemortem thrombus in the left ventricle near its apex. This thrombus was easily stripped from the underlying mural endocardium. Infarcts were present in the spleen and kidneys. There was extensive infarction of the small intestine due to the mouth of the superior mesenteric artery being occluded by the thrombus in the aorta. A small cystic softening was found in the brain involving the left lenticular nucleus and lying almost completely across the internal capsule.



The heart and aorta.

Histological Findings. — The aorta showed widespread and severe damage. The media was very much thinned and its elastic fibres were fragmented and granular. They were interrupted by areas of round-cell infiltration having a characteristic perivascular distribution and giving an apparently typical picture of syphilitic aortitis. The intima was thickened and in its deeper parts there were extensive areas of fatty degeneration. Large plaques of calcification involved both the intima and the adjacent media. The thrombus showed organisation which was most advanced in the arch. The thrombus present in the left ventricle showed early organisation and was apparently not as old as that in the arch of the aorta. The myocardium underlying the thrombus in the heart appeared normal.

The lesion in the aorta appears to be one of syphilitic aortitis accompanied by a very severe degree of atheroma. The mode of development of the thrombus was not obvious. There was no gross aneurysm formation in which the process could have started. There was however a slight pouching of the aorta in the ascending part in which the thrombosis probably commenced.

This case is unusual not only in the extent of the thrombus but also in the fact that although occurring in a young subject the thrombosis arose as a direct result of arterial disease. Aortic thrombosis in young adults is usually a result of emboli from the heart becoming impacted at the bifurcation of the aorta. L. Desclin[1] however has described a case of aortic thrombosis in a woman aged 19 in which the thrombosis was due to a primary aortitis. In his case the thrombus was limited to the ascending part of the arch and the aortitis was of coccal origin and the inflammation practically limited to the intima. In the present case there was no evidence of acute infection and nothing was found which might have contributed to the thrombosis apart from the chronic aortic lesion.

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[1] Frankfurt. Zeits. für Path., 1930, xl., 520.

DIPHTHERIA FORMOL TOXOID AND THE MOLONEY TEST

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In 1929 Moloney and his co-workers [1] stated that "the results of tests on 50 voluntary subjects showed that *the greater the sensitivity to the intradermal* injection (of 1 in 10 dilution of anatoxine) the more marked is the reaction both local and general following the subcutaneous injection of anatoxine. If the diameter of the redness following the intradermal test is less than 10 mm. no marked local or general reaction followed the prophylactic dose of 0·5 c.cm. of anatoxine." In 1928 the same workers [2] recommended a dosage of toxoid depending upon the size of the intradermal test reaction as follows:—

Intradermal injection of 0·2 c.cm. of 1/10 dilution of diphtheria toxoid. (*a*) Redness up to 20 mm. (*b*) Redness over 20 mm. without œdema. (*c*) Pronounced redness + œdema.

Group (*a*)	to have 3 injections of	0·1 c.cm. toxoid	At intervals of 3 weeks.
,, (*b*)		0·02 ,, ,,	
,, (*c*)		0·01 ,, ,,	

It was with a view to confirming the first statement and deciding upon the advisability of varying the dosage as recommended in 1928 or of using some other prophylactic in Moloney-positive reactors that the following investigations were undertaken.

The subjects were recruits to the nursing staff at the North Western Hospital. All were Schick- and Moloney-tested on joining. The Moloney reaction was carefully read and recorded at 24, 48, and 72 hours, and it was found that in almost all cases it was at its height at 48 hours. Reactions were placed in three groups according to size: Group 1 showing an area of redness up to 10 mm. in diameter, Group 2 between 10 and 30 mm., and Group 3 above 30 mm. All Schick-positive reactors were inoculated with formol toxoid; no variation in the procedure or dosage of the prophylactic being made whether the subject was a Moloney-positive or negative reactor. Formol toxoid reactions were divided into local and general; each of these divisions being sub-divided into three groups—i.e., slight, moderate, and severe;

A slight local reaction = local redness up to 1 inch diameter.
A moderate ,, ,, = ,, ,, from 1 to 4 inches.
A severe ,, ,, = redness above 4 inches diameter + swelling.

Temperature was used as the main index of severity of general reactions. Each case was seen by me personally on each of the three days following toxoid inoculations and the temperature taken.

Temperatures between normal and 100° F. were classed as slight.
Temperatures between 100° F. and 102° F. were classed as moderate.
Temperatures above 102° F. were classed as severe.

In all 57 cases were observed, of which 23 were Moloney-positive and 34 Moloney-negative. The results obtained are shown in Tables I. and II.

Two nurses were taken off duty as a result of reactions. One of these had a slight Moloney, but a severe local reaction; the other had a severe Moloney and a severe local reaction.

Table I.—*Positive Moloney Reactors*
(23 cases = 40 per cent.)

Size of Moloney test.	Cases.	Reactions to formol toxoid inoculations.	
		Local.	General.
Up to 10 mm. diameter (8 cases).	1	—	—
	3	Slight.	—
	1	Moderate.	—
	2	Severe.	—
	1	Moderate.	Moderate.
Between 10 and 30 mm. diameter (10 cases).	2	Slight.	—
	1	,,	Slight.
	1	Moderate.	—
	2	,,	Slight.
	1	,,	Moderate.
	2	Severe.	—
	1	,,	Moderate.
Above 30 mm. diameter (5 cases).	1	—	Slight.
	1	Moderate.	—
	1	Severe.	—
	1	Moderate.	Slight.
	1	Severe.	Severe.

Table II.—*Negative Moloney Reactors*
(34 cases = 60 per cent.)

Cases.	Reactions to formol toxoid inoculations.	
	Local.	General.
17 ..	—	—
10 ..	Slight.	—
2 ..	Moderate.	—
2 ..	Slight.	Slight.
1 ..	Moderate.	,,
1 ..	Severe.	Moderate.
1 ..	—	Slight.

The most striking fact which emerges from an examination of the above Tables is that some sort of reaction is to be expected in 50 per cent. of Moloney-negative reactors, and in some 12 per cent. this reaction will be of more than trifling severity. A positive Moloney, however, does indicate the practical certainty of a reaction of some sort following toxoid inoculation. It will also be seen from the Tables that the size of the Moloney is not a true index of the severity of the reaction either local or general to be expected, all grades of severity appearing in each group of Moloney reactors.

Although the series is a small one (57 cases) the figures are strictly comparable with those of Moloney (50 cases). As a result of the investigation no action is to be taken with regard to varying the dosage of toxoid according to size of Moloney reaction.

Conclusion.—The Moloney test has been applied to 57 young adults (nurses). The results suggest that the test is not an accurate index either of the liability to, or severity of, the reactions to be expected in adults after the injection of formol-toxoid.

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[1] Moloney, P. J., Fraser, D. T., and Fraser, C. J.: Ann. de l'Inst. Pasteur, 1929, xliii., 124.
[2] Moloney, P. J., and Fraser, C. J.: Ibid., 1928, xlii., 1420.

National Institute of Industrial Psychology.—A vacation course in the administration of Binet-Simon tests of intelligence will be held at the Institute of Education, London, from August 14th to 24th. The course is intended for doctors and nurses and others concerned with mental hygiene, and particulars can be obtained from the National Institute of Industrial Psychology, Aldwych House, London, W.C.2.

REVIEWS AND NOTICES OF BOOKS

Injuries and their Treatment

By W. ELDON TUCKER, B.Chir. Camb., F.R.C.S. Eng., Surgeon to St. John's Hospital, Lewisham; Surgeon to the London Clinic for Injuries, Baker-street; late Registrar, Royal National Orthopædic Hospital. London: H. K. Lewis and Co., Ltd. 1935. Pp. 174. 9s.

THE pathology and treatment of injuries to the soft structures of the body is a subject which never seems to arouse much interest among the juniors in hospital circles. The student or resident who is bored with sprains and strains, and does not bother to learn much about their treatment, gets an unpleasant shock when he finds how much importance he is expected to attach to such injuries in general practice. Sir Humphry Rolleston notes in a preface to this volume that Mr. Eldon Tucker's interest in his subject and his knowledge have been acquired in a very practical way—by treatment of injuries in fellow athletes. Many text-books have been written dealing with a special form of treatment, such as massage, electrotherapeutics, or graduated muscular contractions; Mr. Eldon Tucker examines *all* the methods that he considers useful, and in a chapter at the beginning of his book compares the results to be obtained by each. He is then in a position to prescribe the suitable combination of methods for each injury in turn. Particularly welcome are the details of joint manipulation with comments on an appreciation of its advantages and dangers at the various stages of repair after injury. Too prolonged rest is held by the author, as by many of his colleagues, to favour fibrosis of ligaments and muscles, whilst too active massage and movements in the acute stages may increase effusion into and around the joint. The two aims of treatment are described as the promotion of sound repair of the injured structures and the absorption of the traumatic effusion as rapidly as possible; chronic affections of joints and muscles are thus avoided.

The chapters on osteo-arthritis and on fibrositis are illuminating, and the comments on the successes and failures of the osteopath are of topical interest. In the sections dealing with particular joints we are especially glad to note the insistence on the importance of the recovery of full quadriceps power in knee-joint injuries; the warning against the dangers of manipulation and of all passive movements in injuries of the elbow-joint; and the description of the exact type of manipulation to be practised at the shoulder-joint, together with its contra-indication in sprain of the supraspinatus muscle. The subject matter of this volume should be familiar to every doctor, and thanks are due to the author for having presented it in such a readily accessible form and in such small compass.

The Kidney in Health and Disease

In Contributions by Eminent Authorities. Edited by HILDING BERGLUND, M.D., and GRACE MEDES, Ph.D. With the collaboration of G. CARL HUBER, M.D., WARFIELD T. LONGCOPE, M.D., and ALFRED N. RICHARDS, Ph.D., M.D. London: Henry Kimpton. 1935. Pp. 754. 45s.

THIS book is said to be an "outgrowth of a symposium on the structure and function of the kidney in health and disease which took place in Minneapolis in the summer of 1930." The principal organizer of this meeting was Dr. Hilding Berglund, at that time professor of medicine in the university of Minnesota. Of the 41 contributors 37 are American and a third of these at the time of the meeting held posts in this university; the somewhat parochial atmosphere of many of the papers may be due to this fact. The standard of the contributions is rather uneven. That the bias is on the physiological and biochemical aspects of renal research is suggested by the title, but other and more clinical topics are not neglected; of particular merit is a succinct and authoritative account of the histological changes in Bright's disease by E. T. Bell. Interesting observations and discussions of the different aspects of proteinuria, including the phenomenon of Bence-Jones proteinuria, and of œdema, with an account of the technique and effects of plasmaphæresis, will also be found. The uses of renal function tests are fully described. W. L. Longcope, J. Bordley, and F. D. W. Lukens adduce further evidence of the important part played by hæmolytic streptococci in Bright's disease. On the clinical side a description of the retinal changes in nephritis and hypertension by H. P. Wagener is supplemented by an illuminating discussion of points in their pathology by J. S. Friedenwald.

F. Volhard contributes articles on hypertension, including both pale and red varieties, uræmia, and the treatment of acute diffuse glomerulitis. Few histologists would hesitate to challenge his statement (p. 249) that "the histological picture of kidney insufficiency, whether produced through subacute or severe chronic nephritis, through malignant sclerosis or amyloid disease, or through drastic reduction of healthy renal tissue, is always the same: an astonishing dilatation of the remaining tubules and a high-grade flattening of their epithelial cells. One can see at once from a kidney section whether the patient died from renal insufficiency or not." The morbid histology is unfortunately not as simple as that, and it is a pity that so renowned an authority on renal disease should utter such a misleading statement. There seems still to be a gulf between the exponents of the clinical and the pathological aspects of nephritis, which will have to be bridged before a symposium such as this is much good to the student. Senior workers, however, will find stimulating material in its pages, making it worth their while to read it.

Eden and Lockyer's Gynæcology

For Students and Practitioners. Fourth edition by H. BECKWITH WHITEHOUSE, M.B., F.R.C.S. Eng., F.C.O.G., Professor of Midwifery and Diseases of Women, University of Birmingham. London: J. and A. Churchill Ltd. 1935. Pp. 964. 38s.

Eden and Lockyer's "Gynæcology" has been generally regarded as one of the best standard medical text-books ever produced in this country. Prof. Beckwith Whitehouse states that for this reason he approached the task of the complete revision of the work for its fourth edition with some misgivings. It is due to him that we should record the opinion, which will certainly be shared by those who study the outcome of his efforts, that he has succeeded in maintaining the high standard previously set. The advances made during recent years in gynæcology have necessitated the addition of new subject matter and the rewriting of several sections. The chapters dealing with the physiology and pathology of menstruation contain a balanced account of the knowledge at present available upon this intricate problem. The sections concerned with diseases of the ovaries have also been largely re-cast, with the introduction of new material under the title of Morbid Conditions of the Graafian Follicle and Corpus Luteum. Forty pages in Section 4 are allocated to the diagnosis of disease of the female pelvic organs. The latter part of the book is devoted to the operative side of treatment, and the description of each operation is preceded by a clear exposition of the indications for its performance. The careful account of post-operative treatment is invaluable.

We can offer no criticisms of any constructive value. The trouble expended by the publishers over the reproduction of the 600 illustrations, of which 36 are coloured, is the subject of well-deserved acknowledgment by the author.

Clinical Aspects of Visceral Neurology

By W. K. LIVINGSTON, M.D., Clinical Associate in Surgery, University of Oregon Medical School. London: Baillière, Tindall and Cox. 1935. Pp. 254. 22*s.* 6*d.*

THE author states in the preface to this volume that he intends to set forth his observations on the pre- and post-operative condition of 300 patients who have been treated by excision of some part of their sympathetic nervous system. Seeing that his experience has extended over a period of ten years we might expect the book to provide just that information which is most needed by those interested in the problems of visceral neurology. Any such expectation, however, is doomed to disappointment, for Dr. Livingston has occupied too much of his space in repeating well-known anatomical and physiological facts, and he has set down no clear statement of the results of his own operations. As a review of the more recent literature of the surgery of the sympathetic system the book is of real value, but a surgeon with Dr. Livingston's experience ought to add to our knowledge more than can be obtained from a bibliography.

The book refers to all the conditions for which sympathectomy has been performed, some of the references being of necessity brief, but special stress has been laid upon the surgical treatment of vascular diseases. The author's opinion, "there is no dividing line between Raynaud's disease and the Raynaud-like phenomena observed in the other clinical conditions such as thrombo-angiitis *obliterans*," is borne out by his records, for of 7 cases he quotes as examples of Raynaud's disease only 2 conform to the commonly accepted criteria. This unusual point of view vitiates any arguments which he brings forward regarding the nature of these vascular disorders. The number of charts of skin temperature tests bears witness to the importance of this method of investigation, but it is strange that so little is said about the effect of cooling the limbs to be tested; and since 17 out of the 22 tests used as illustrations were carried out at room temperatures of over 20° C., and in some cases at a temperature of nearly 30° C., it is unlikely that the results of these tests are at all comparable with those performed under more carefully controlled conditions. It is also remarkable that with such a wealth of available material there should have been included as an example of the effect of spinal anæsthesia the chart of a case in which the spinal anæsthetic failed to act. The chapter on surgical technique includes some useful practica suggestions, but a study of the book as a whole leave one with the impression that an authoritativ evaluation of the late results of sympathectom has yet to be made.

Forensic Medicine

By DOUGLAS KERR, M.D., F.R.C.P.E., Lecture on Forensic Medicine in the School of Medicin of the Royal Colleges, *Edinburgh.* London A. and C. Black Ltd. 1935. Pp. 311. 15*s.*

Dr. Douglas Kerr does not put this book forwar as an exhaustive work of reference. It is writte for medical students, but also contains guidanc for the practitioner. As police surgeon and medica referee to the city of Edinburgh he has wide experience, and he has been able to include from his ow medico-legal practice several striking photographi illustrations. Expressed with the clarity which on associates with good lecturing, his chapters o professional ethics and on the relation of crime an insanity are excellent. The information on toxicolog and on such special matters as blood-groups is se out in brief but comprehensive fashion. The Scottis legal procedure is as fully dealt with as the English. Such criticisms as we would offer are all trivial. It might, for instance, have been stated on p. 124 that for England the important Section 12 of the Children Act (on neglect) has been replaced by Section 1 of the Act of 1933. A like amplification is wanted on p. 188 where the 1932 enactment has been replaced as respects England by Sections 50 and 53 of the later statute. A careful study of Dr. Kerr's competent pages, doubtless destined to grow more voluminous in future editions, will enable readers to face cross-examination with confidence either in the examination room or in the witness-box in a court of law.

Lungentuberculose und Schwangerschaft

By H. BRAEUNING, Chefarzt der *Fürsorgestelle* für Lungenkranke in Stettin. Leipzig: Georg Thieme. 1935. Pp. 275. M. 24.

THAT pregnancy is capable of lighting up a latent tuberculous lesion and aggravating an active one has long been an accepted view; Dr. Braeuning's investigations have been directed towards the more exact measurement of these risks in the various types and stages of the disease. He concludes that during and after pregnancy severe and fatal relapse occurs in about 6 per cent. of cases, transitory aggravation in 20 per cent. As relapse is frequent quite apart from pregnancy these recurrencies must not be attributed entirely to pregnancy. In 102 cases of therapeutic or spontaneous abortion there was only one fatal relapse and three temporary setbacks. Relapse associated with pregnancy was found to be rather less common in fibrotic forms of the disease than it was in the exudative; but this again corresponds to experience in non-pregnant cases and it is therefore not justifiable to conclude that pregnancy has a particularly unfavourable influence on the exudative type of disease.

Twenty-four completed pregnancies in 22 women with cavities were followed by three severe and five transitory relapses. In advanced tuberculosis the prognosis is already so bad that pregnancy does not appear to shorten life; death before the end of the pregnancy is uncommon even when the disease is severe at its commencement. An unsuccessful attempt was made to forecast the likelihood of relapse by means of the sedimentation test at the beginning of pregnancy.

Br. Braeuning finds little correlation between the direction in which the disease is progressing when the pregnancy starts and the probability of relapse. He cites several cases of women who, although going downhill when they became pregnant, steadily improved during and after pregnancy;. others making good progress before becoming pregnant, suffered severe relapse, usually after delivery. Neither the original severity of the disease nor a tuberculous family history appear to have any influence on the likelihood of relapse.

The mortality during the first five years of life of children born from tuberculous mothers was found to be only 1 to 4 per cent. higher than the average. These figures are in striking contrast with the high mortality figures usually cited for untreated children by the advocates of B C G. The author actually finds no increase in infant mortality when the mother is suffering from open tuberculosis; a fact which he attributes to the great care which this group receives from the public health authorities. The main conclusion which may be drawn from this important investigation is a negative one. Modern research has failed to make more precise the knowledge that the strain of pregnancy in tuberculous women increases the risk of relapse.

Beesley and Johnston's Manual of Surgical Anatomy

Fourth edition. Revised by JOHN BRUCE, M.B., F.R.C.S.E., Tutor in Clinical Surgery, Royal Infirmary, Edinburgh; and ROBERT WALMSLEY, M.B., Ch.B., University Assistant and Demonstrator of Anatomy, Edinburgh University. London: Humphrey Milford, Oxford University Press. 1935. Pp. 717. 20s.

THE original authors of this well-known work being no longer able to cope with the responsibilities associated with the issue of a new edition, Mr. John Bruce and Mr. Robert Walmsley have taken up the burden of revision and reconstruction. They have produced a very good book, decidedly larger than in the last edition, which will meet the requirements of the present-day student. The anatomy is sound, and applied with judgment except in a few places. For example, even if one admits the possibility of the separation of the upper humeral epiphysis, it seems likely that the muscles inserted into the epiphysis have more to do with the injury than has the capsule. There is an excellent general account of the autonomic system. The writers have resisted the temptation to introduce such experimental details as frequently confuse and irritate the reader, and have produced a clear and eminently understandable account of the matter. The commoner surgical procedures which have to do with this system are shortly but well described from the anatomical side, but the few lines which deal with removal of the right lumbar trunk might be improved by some mention of the presence of the vena cava and ureter. In a future edition, some of the developmental data given throughout the book should be revised. The work seems to meet well the purpose expressed in the preface, the provision of a manual for use by senior students in the dissecting room; for such a purpose it can be heartily commended. It is well produced and clearly, if not too profusely, illustrated.

Electrokinetic Phenomena

And their Application to Biology and Medicine. By HAROLD A. ABRAMSON, M.D. American Chemical Society Monograph Series. No. 66. New York: Chemical Catalog Company, Inc.; London: Arthur F. Bird. 1934. Pp. 331. 33s. 6d.

THE American Chemical Society Monograph Series contains some most valuable works of reference to isolated chemical problems, and this volume will add to its reputation. In the space of some three hundred pages Dr. Abramson has provided a clear and comprehensive account of the application of physical methods, such as electrodialysis to biological and medical problems. The first chapter is concerned with historical development. Starting with an excellent photograph of Smoluchowski the author traces the development of the study of electrochemistry and gives in considerable detail the earlier work of Reuss, who, as he points out, was the true discoverer of electro-osmosis The way in which Dr. Abramson leads up to the conception of the electric double layer and its bearing on physico-chemical phenomena deserves special praise. The text is attractively illustrated by reproductions of the early apparatus. Later chapters deal first with the theoretical aspects of the subject and then with its practical applications to various problems of biochemistry and bacteriology. The summary of the literature is judicious and contains a useful section on the patent literature.

The Theory of Gymnastics

By Prof. JOHANNES LINDHARD, M.D., Professor of Gymnastic Physiology, Laboratorium, University of Copenhagen; Principal of State Institute of Gymnastics, Copenhagen. London: Methuen and Co. 1934. Pp. 359. 12s. 6d.

THIS is a serious analysis of gymnastics, which will be found stimulating by those interested in the various schools of physical education and in the applied theory of movement. Prof. Lindhard is somewhat antagonistic to the accepted Swedish Ling school of gymnastics. Many of his contentions, we feel, could be countered by a more understanding knowledge of the views of the best thinkers and not the average workers of this school. He discusses, in an original way, the development of gymnastics and its modifications. His critical allusions to modern system modifications, as those of Bukh, Björksten, Knudsen and Elin Falk, are not unjust. He deals at length with the various classifications of exercises, and comments on the aim and application of gymnastics as evinced by these groupings of movements. He has little use for the orthodox conception of the fundamental standing position, which in his view compares unfavourably with the classical Greek form, and he analyses the "attention" position of any system as its keynote.

Prof. Lindhard lays emphasis, illustrated by detailed anatomical facts, on the differences between the sexes, and on the desirability of different movements for men and women. This thesis he seems to pursue too far in proclaiming an arbitrary taboo on certain movements for women on æsthetic grounds. The idea that the gymnast is endeavouring to straighten the natural curves of the spine beyond Nature's intention rouses Prof. Lindhard to a brisk attack. This zeal might be modified by the consideration that the whole of civilised daily life tends to increase these curves, and the idea behind any but the most unintelligently military system is simply a return to normal. His analysis of breathing exercises, however, provides a fresh and stimulating outlook, and his comments on the association of respiration with heart function are original and suggestive. The section on marching is also of practical interest. Throughout the book Prof. Lindhard appears to be reacting against a hypothetical antagonist; those who uphold traditional methods of gymnastics would probably agree with many of his criticisms, and would yet find adequate reasons for adapting rather than scrapping the orthodox routine.

Medicine in Persia

By CYRIL ELGOOD, M.D., M.R.C.P. Clio Medica Series. New York: Paul Hoeber. 1934. Pp. 105. $1.50.

THE attitude of the Persians to medicine seems to have been chiefly receptive, the teaching of their own Zoroaster having been modified by Egyptian, Mesopotamian, and especially by Greek influences. Successive political changes, and no doubt the artistic langour of the East, prevented their producing more than three great physicians—Rhazes, Avicenna, and Ismail. Of these, Rhazes (A.D. 850–932) is the best known for his differentiation of both measles and small-pox, but he also introduced mercury ointment, and discovered sulphuric acid amongst other things. Avicenna (A.D. 980–1037) was renowned for his celebrated "canon," founded largely on Galen and received with joy by European physicians in the sixteenth century. Ismail, who died in A.D. 1136, described exophthalmos as an accompaniment of goitre and was thus, as Dr. Elgood points out, the first to observe a sign rediscovered by Dr. Parry in 1825. On the whole the treatment of physicians by Persian monarchs appears to have been good, and it is clear from Dr. Elgood's learned and instructive work that hospitals and medical schools flourished in Persia and Bagdad long before they were founded in European countries. According to Dr. Elgood, the medicine of the New Testament shows evidence of the influence of Persian medicine, and the term Magus is the old Persian name for a Zoroastrian priest.

L'épaule

Anatomie des Formes Extérieures, Anatomie Radiographique, Chirurgie Opératoire. By ANTOINE BASSET, Professeur agrégé à la Faculté de Paris, Chirurgien de l'Hôpital Beaujon; and JACQUES MIALERET, Aide d'Anatomie à la Faculté. Paris: Masson et Cie. 1934. Pp. 292. Fr.65.

THE authors have now produced two volumes in their series dealing with the topographical anatomy and surgery of the large joints. That dealing with the knee-joint has already been reviewed in these columns; the volume on the ankle-joint is being prepared. The complete series will undoubtedly be an asset to any surgical library. The standard set by the first volume was high, and it has been well maintained. The general scheme followed here is for the most part the same as in the account of the knee-joint. The first and smaller part of the work is devoted to anatomical descriptions, including surface anatomy and radiographical appearances, both of the normal joint and of joints specially prepared by injections of the capsule and arteries. Reconstructions of the muscle relationships have been produced by drawing the muscles over radiograms. Anatomical points of surgical importance are noted. This part of the book is profusely and finely illustrated; the illustrations, indeed, are descriptions in themselves.

Operative surgery is dealt with in the second part. The authors seem to have been at pains to include every operation and every incision that can possibly be used to expose the shoulder-joint. This mass of information tends to bring confusion in its wake, even though a résumé is given at the end of the chapter on incisional approach by the five routes which are considered to be of value. In the section on injury the indications for operation are clearly presented. Three principles are laid down: (1) in all injuries in the region of a joint it is essential to make sure whether the joint itself is or is not involved; (2) in all non-infected articular injuries closure without drainage is to be performed; and (3) all infected injuries of joints are to be treated by free drainage. Exploration by open incision, dividing layer by layer, of any wound suspected of opening into the joint is recommended. The futility and danger of exploring by a probe is emphasised. Dislocation of the shoulder is discussed at length in as far as the injury may require open operation.

The consideration here devoted to the after-results of the various surgical procedures will be welcomed.

Anatomy: The Thorax

Fourth edition. Part V. (Catechism Series). By C. R. WHITTAKER, F.R.C.S.E., F.R.S.E., Lecturer on Anatomy, Surgeons' Hall, Edinburgh. Edinburgh: E. and S. Livingstone. 1935. Pp. 59. 1*s.* 6*d.*

THIS well-known series certainly helps those students to whom all the institutes of medicine (as well as that art itself) are simply exercises for their memories and hardly at all for their reasons. For these, books of this kind can be recommended, not as treatment of the condition but to relieve or hide the symptom. This little book is full of accurate information, from cover to cover, but that is not to say that it can teach thoracic anatomy to those who will not use their faculties properly. On the other hand, it may help those who have some knowledge of the subject to get their information in order.

REPORTS AND ANALYSES

MOUSSEC

(MOUSSEC LTD., 175–6, PICCADILLY, W.1)

THIS is a sparkling wine of the champagne type prepared from imported grape must and fermented in this country by suitable selected champagne yeasts. The treatment of the wine during and after fermentation is the same as carried out in the well-known wine houses in France. When analysed the following results were obtained:—

Alcohol (by volume)	12·0	per cent.
Equivalent to proof spirit	20·65	,,
Total extractives	3·93	,,
Consisting of—		
Invert sugar	1·97	,,
Cane sugar	0·29	,,
Fixed acidity (as tartaric acid)	0·51	,,
Mineral matter, &c.	1·16	,,
Volatile acidity (as acetic acid)	0·06	,,

The wine has the appearance, composition, and general properties of an ordinary dry French champagne. It is light and pleasant to the palate, and has an agreeable aroma. The manufacturers would seem to have succeeded in making, in this country, an attractive and wholesome wine closely resembling the imported product.

THE LANCET

LONDON: SATURDAY, JULY 6, 1935

THE INFLUENZA VIRUS IN RELATION TO PROPHYLAXIS AND TREATMENT

If there are any who are still truly in doubt whether the prime cause of epidemic influenza is a filtrable virus, let them read the Linacre lecture delivered recently by Sir Patrick Laidlaw, F.R.S.[1] They will find there set out with admirable clearness the evidence which Laidlaw and his colleagues, C. H. Andrewes and Wilson Smith, have produced in support of the virus hypothesis. It is a record of brilliant work which makes a most convincing story, the more so because of the restraint with which it is told, and because of the scrupulous care with which each fact has been weighed and examined before being accepted.

The history of the virus hypothesis of the cause of influenza falls naturally into two periods. Prior to 1933 the only available experimental animal was man, on whom the hypothesis could not be adequately tested, and though evidence had been obtained in support of the virus theory, it fell far short of convincing proof. In 1933 came the important announcement in our columns by Smith, Andrewes, and Laidlaw[2] that the ferret was susceptible to influenza. A new era in influenza research was inaugurated and the march of events has been rapid. The demonstration in 1933 that a filtrable virus is present in the nasopharynx of early cases of epidemic influenza and that specific antibodies can be demonstrated in the blood of human and ferret convalescents was soon followed by the discovery that the mouse is susceptible to the influenza virus and that it is possible to prepare a specific antiserum in the horse.[3] The group of workers at Hampstead were now in a position to isolate and type viruses from subsequent cases of influenza. The year 1934 proved disappointing inasmuch as there was no widespread epidemic of influenza in London from which to obtain material, but the one strain isolated was shown to be identical with the 1933 strain. In the winter of 1934–35 eight new strains were obtained, six from an outbreak in Shorncliffe and two from the London area; these again, though not yet completely investigated, seem to be identical with those previously isolated. Added to this comes evidence from America where Dr. T. Francis, Jun., working at the Rockefeller Institute, has isolated two strains of influenza virus, one from an outbreak at Porto Rico and one from Philadelphia in 1935. Both these strains are neutralised by the specific antiserum made at Hampstead by the British workers, so that it would appear that epidemic influenza is produced by one and the same virus in different parts of the world. The virus hypothesis, to quote Laidlaw's words, is "already transformed into a theorem."

What is the practical significance of this? The clinical observation that one attack of influenza in man does not leave a lasting immunity, and the lack of success which has attended attempts at serum *therapy* in virus infections might well suggest that these discoveries while of immense scientific interest may be of little material value in the control or treatment of epidemic influenza. That such a hasty conclusion would be quite unjustified at this stage is clear from the two new papers dealing with immunological problems of experimental influenza just published by the Hampstead team.[4] [5] The ferret, they find, as the result of recovery from infection with influenza virus, becomes immune to reinfection; specific antibody is present in its blood. But after an interval of a few months this immunity wanes, the antibody titre falls, and the animal becomes susceptible to reinfection. It is important to note that the ferret becomes susceptible again despite the presence of some circulating antibody, and that its immunity can be restored by the inoculation of virus subcutaneously, a non-infective route. Now random sampling of human sera has shown that the very great majority contain antibody for the virus, presumably as the result of previous infection, and it seems just possible that, as in the ferret, the immunity possessed by humans could be reinforced by prophylactic inoculation. In this way it might be possible to tide individuals over the period of epidemics of influenza. Another point of importance which emerges from these recent studies of influenzal immunity is that the antiserum made in the horse seems to possess some therapeutic value when tested in the mouse. When serum is given along with virus, infection can be prevented; that was to be expected. But the astonishing thing is that even when given 48 hours after infection, this serum exerted a quite definite effect on the course of infection, as was evidenced by the reduced mortality-rate. In one experiment serum given even three days after infection had an appreciable effect. The authors are naturally chary in forecasting the value of this serum used therapeutically in man, but the prospect that a serum of such a high potency may be of use in the treatment of influenzal pneumonia seems sufficiently likely to make its clinical trial an exciting adventure.

THE SINGER'S NODULE

The little nodule which makes its appearance on the vocal cord is never a danger to life or health, but is of serious importance to professional voice-users whose means of livelihood it may destroy for a prolonged period or even permanently. In England it is usually called the "singer's nodule," though it is at least as liable to occur on the cords of other voice-users, such as school-teachers; among singers it is commoner in sopranos and tenors than in alto or bass voices, and it is fairly frequent in young children. It may be unilateral or bilateral, and is situated on that part of the vocal cord which is the "seat of election" for this and other small innocent growths. This seat of election is variously stated by different authorities to be at the junction of the anterior and middle thirds of the vocal cord, or at the middle of the cord, which position corresponds to the junction of the anterior and middle thirds of the glottis, the hinder third of the glottis being bounded by the arytenoid cartilages. Dr. Jean Tarneaud in an informative and erudite study of this node and its manifestation[1] gives the former, but his diagrams appear rather to favour the latter situation.

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[1] Laidlaw, P. P.: The Lancet, 1935, i., 1118.

[2] Smith, W., Andrewes, C. H., and Laidlaw: Ibid., 1933, ii., 66.

[3] Andrewes, Laidlaw, and Smith: Ibid., 1934, ii., 859.

[4] Laidlaw, Smith, and Andrewes: Brit. Jour. Exp. Path., June, 1935, p. 275.

[5] Smith, Andrewes, and Laidlaw: Ibid., June, 1935, p. 291.

It is common ground among laryngologists that these nodules are the result of abuse or faulty production of the voice, and of the nature of a corn due to local attrition; but the exact mechanism of their causation has never been satisfactorily explained. The principal object of Dr. Tarneaud's monograph is to supply the deficiency, which it does in a precise and ingenious manner. Some laryngologists believe that inflammatory swelling of the cords, by bringing their centres into contact during phonation, is the cause of irritation at this spot, but Dr. Tarneaud denies that inflammation plays any part, or that any sign of inflammation is ordinarily apparent. Inflammatory paresis of the thyro-arytenoid muscles is classically represented by an oval glottis with separation of the cords. Neither is the site of the nodule the place of maximum vibration, for he finds on examination with the stroboscope that the cords vibrate equally throughout their length. The little globule of mucus, which is sometimes seen to collect on the seat of election during phonation, would not remain on the place of maximum vibration. The existence and situation of this globule is important for the author's argument; he believes that it forms where it does because this place has pathologically become the lowest point of the cord. According to him the essential cause is a myopathic paresis of the tensors and adductors; the former causes a downward sagging of the cords, while the latter produces an eversion whereby the lowest point is directed inwards and so approaches the corresponding point of the opposite cord. It is an ingenious hypothesis, arrived at by much thought and painstaking observation, and not lightly to be dismissed. In treatment, Dr. Tarneaud favours surgical removal of the nodule, and treats perhaps rather lightly the danger of damage to the cord even by experienced laryngologists; he rightly insists on the paramount importance of vocal re-education in the after-treatment, and is convinced that good results cannot be obtained by silence without re-education. He does not deny that cures have been obtained by vocal rest, but believes that they are rare, and he emphasises the bad moral effect of prolonged silence on the professional singer.

PHARMACEUTICAL STERILISATION

There has of late years been an immense increase in the quantity and variety of remedies administered by some form of injection, and the question of how the solutions used should be sterilised has thus assumed considerable importance. To ensure complete sterility means nothing short of autoclaving; many dispensing chemists do not possess autoclaves, and no one knows whether certain drugs are sufficiently thermostable to resist this process. Filtration is another process employed by the more enterprising, but this itself demands the possession of an autoclave in order to sterilise the filters; it is subject also to doubts connected with the possible adsorption of active ingredients in a solution by the filter itself. It has been a common practice to attempt sterilisation by discontinuous heating (Tyndallisation), the assumption being that spores will be transformed into vegetative bacteria during the intervals between heatings and so become vulnerable to moderate heat. This process serves well for culture media, as it did for Tyndall's hay infusions in 1881, because a nutritive environment encourages multiplication; but there is nothing in most solutions of drugs to beguile a spore into a misguided attempt to grow, and it is consequently not surprising that H. Davis[1] found discontinuous heating to 80° C. incapable of sterilising solutions containing spores. He described to the British Pharmaceutical Conference held last week in Belfast several further series of experiments with a bearing on this matter, which are published in the special number of the *Quarterly Journal of Pharmacy and Pharmacology* devoted to the proceedings of this conference. In the first place it would appear that if solutions are made with precautions against contamination they will often be sterile from the beginning, since he has shown that many drugs in the solid form are free from bacteria, or form solutions which are actually bactericidal (for *Staphylococcus aureus*). The former findings must be accepted with reserve, because the quantity cultivated is not specified, and the absence of growth may have been due simply to inhibition by the drug itself. The temperature of incubation is also not mentioned; it was presumably 37° C., and quite different results, though possibly of less importance to the safety of the patient, might have been obtained at a lower temperature. It has to be remembered that solutions which originally were sterile may become contaminated during repeated use, and this fact introduces the question of preservatives—another matter in which finality has by no means been reached, since no known preservative has ideal qualities, and some have known or may have unknown effects on the solutions in which they are used. Davis has tested a number of these, with disappointing results in the case of chlorbutol and certain *p*-hydroxybenzoic esters which have recently found favour on the continent, and highly favourable results for merthiolate and *para*-chloro-*meta*-cresol. The only test organism used was *Staphylococcus aureus*; other bacteria and moulds might well have been found to be much more resistant.

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[1] Le Nodule de la Corde Vocale. Par Dr. Jean Tarneaud, Oto-Rhino-Laryngologiste de l'Hôpital Bellan et du Conservatoire National de Musique de Paris. Paris: Norbert Maloine 1935. Pp. 139. Fr. 30.

[1] Quart. Jour. Pharmacy and Pharmacol., 1934, vii., 379.

Incomplete as this information is, it serves to explain a good deal of past experience, and may afford useful preliminary indications to anyone inclined to pursue the matter further. The fact is that ordinary cleanliness and simple boiling will obviate all but very remote risks; to remove that final residuum of danger there is no alternative to autoclaving or filtration, and one of these processes should certainly be applied to such materials as calcium chloride solutions, and solutions capable of supporting bacterial growth or used for such purposes as retrograde pyelography or injection into any other vital and vulnerable tissues. Hypodermic and intravenous medication, in spite of the frequent use of contaminated solutions, is generally safe either because the bacteria concerned are non-pathogenic or because the connective tissues and the blood are capable of disposing of them.

VARIOUS KINDS OF MILK

FEW people understand the meaning of the titles under which milk is now sold in this country, and it is satisfactory to hear that a less complex terminology is under consideration by the Ministry of Health. So far as the proposals are available the chief differences lie in the discontinuance of the present "Certified" grade; the use of the term "Certified" for milk produced under almost the same conditions as the present Grade A (T.T.) (the latter name being abandoned); and the abolition of "Grade A" in favour of a new designation "Standard," this name, however, being applied for wholesale purposes only. The simplification of nomenclature is all to the good. The new Certified milk comes from herds freed from tuberculosis and will be produced according to a fair standard of cleanliness, not more than 200,000 bacteria being present in each cubic centimetre at any time before delivery to the consumer. Such milk is almost safe as regards risk from tuberculosis, but it may of course contain *Brucella abortus* and other organisms; for example, E. J. PULLINGER,[1] examining 101 samples from 45 tuberculin-tested herds found tubercle bacilli in 1 and *Br. abortus* in no less than 70. Accordingly, for the benefit of those who demand precautions beyond tuberculin-testing and cleanliness, permission will now be granted to pasteurise Certified milk. So much for the highest grade: now we turn to the new Standard milk, on which interest will largely centre. The demise of Grade A, with its unwarranted implication of high quality, will certainly not be lamented, but it has to be noted that the requirements for Standard milk are even lower. This grade, as already stated, will not be sold as such to the public, and apparently it is defined purely in order to enable its producers to qualify for the roll of "accredited producers" under the Milk Marketing Board. The cows are not to be tested with tuberculin and the quarterly veterinary inspection they will undergo is an insufficient precaution against excretion of tubercle bacilli in the milk—apart from other risks. The requirements for production are below those for Grade A, and instead of a definite bacteriological standard a simple colour test is proposed. The details of this proposal are not yet forthcoming, but it is generally held that all the published colour tests (such as the methylene-blue reduction-time) are variable in their indications and too lenient for use in obtaining a reasonable level of cleanliness. Standard milk, like accredited milk as originally proposed, will be somewhat cleaner than ordinary market milk, but very little safer. It cannot be recommended by the medical profession as safe for consumption in the raw state and it will therefore need pasteurisation.

In the new Order pasteurised milk is to be defined very much as at present, with some small improvements. The bacterial count is to be not more than 100,000 per c.cm. at any time before delivery to the consumer; on the other hand no standard is laid down for testing the efficiency of pasteurisation and the difficulty remains that bacteria may be added in the cooler and the bottles and by multiplication after heating. Hitherto no convenient test for adequate pasteurisation has been available: the presence of tubercle bacilli can be ascertained by inoculation into guinea-pigs, but this is not a method suitable for routine testing of the efficiency of commercial plants. In these circumstances close attention should be paid to the paper by Prof. H. D. KAY and Mr. F. K. NEAVE in our last issue describing a phosphatase test and illustrating its practical utility. Phosphatase in milk, it appears, has the happy characteristic that it is destroyed at almost the same time-temperature combination as the official requirement for pasteurisation, and the presence or absence of this ferment in milk is therefore a guide to the efficacy of the heating process. KAY and NEAVE's investigation suggests that much of the pasteurised milk they examined had been heated insufficiently, and if their test is accurate it shows a large number of pasteurising plants of all sizes both in London and elsewhere are functionally inefficient or unsatisfactorily operated. This conclusion, however, comes as no surprise, and the explanation is not far to seek. Supervision of pasteurising plant is a definitely technical task, but in practice it is in the hands of sanitary inspectors with very wide duties, few of whom really understand the criteria either for licensing or operation. Much more elaborate instruction is needed for those charged with this responsible work,[2] and it seems decidedly unfortunate that in the proposed Order, while Certified and Standard milk are to be supervised by county and county borough councils, the licences for pasteurised milk are still to be issued by the local sanitary authorities.

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[1] THE LANCET, 1931, i., 967.

[2] *Vide* Sir W. Dalrymple-Champneys's report on the supervision of pasteurising plants. Min. of Health Rep. on Pub. Health and Med. Subjects No. 77. 1935. Reviewed in THE LANCET of May 18th, p. 1152.

This means that in the counties responsibility for these plants will be in the hands of a large number of rural sanitary inspectors without any special experience of the essential requirements; whereas under county councils it would be practicable to put all this work in the hands of a single officer who could be given the necessary training.

Talk about milk and its designations is interminable, and there must be many medical men who feel that it bears little relation to their own work. But statements such as those made by Dr. VEITCH CLARK, medical officer of health for Manchester, in the paper reported on p. 38, are really a challenge to the profession and the community as a whole. It is intolerable, he said, that we should put up with the sale of a food known to be producing an enormous bulk of disease, and he recommended pasteurisation as the principal solution of the immediate problem. Properly performed, this process will kill tubercle bacilli and *Br. abortus*, as a further paper by Mr. PULLINGER in our issue of June 8th once more illustrates. And there is no reason why it should not be properly performed if we will only insist on a high standard of equipment, supervision, and laboratory control.

ANNOTATIONS

CHRONIC RHEUMATIC DISEASES

THE British Committee on Chronic Rheumatic Diseases, already in existence under another title, was officially adopted by the College of Physicians early in 1934, for the purpose of stimulating professional interest in rheumatoid arthritis and related conditions, and encouraging the investigation of them. The committee now presents its first report,[1] a handsome volume of 170 pages. Sir Humphry Rolleston, the chairman, opens it with a foreword, which, like an operatic overture sketches the themes that are to follow. Dr. W. S. C. Copeman, the secretary, records briefly the history of the committee, which is clearly no perfunctory body, but a group of active and responsible people who feel that the profession is doing less than it ought to grapple with a common and cruel disease. Then comes a series of papers, some by members of the committee and some by others associated with it, which indicate the attitude of British medicine to the major problems of chronic rheumatism, and the lines along which some current investigations are proceeding. The first of these is the report of the nomenclature subcommittee, offering as basis for a working classification the familiar headings "rheumatoid" and "osteo-," but applying these to types of joint change, not to actual diseases. The rheumatoid type includes gonococcal and other specific arthritides, alongside Still's disease, classical rheumatoid arthritis, and climacteric villous arthritis; the osteo-arthritic type embraces some gouty joints, and Charcot's joints, as well as osteo-arthritis of traumatic and of unknown ætiology. The justification for this lies in the morbid anatomy, which is set forth in a dozen pages of excellent description.

Among the contributors Dr. John Freeman sketching the present position of allergy and hypersensitiveness in chronic rheumatism and arthritis, looks with a properly critical eye, and paints with a lively brush. "Allergy" is for him so difficult to define, so vague and variable in its uses, that he finds it more hindrance than help; he suggests indeed that the euphony of the word is more responsible for its popularity than any idea lying behind it. In the fog that covers the bacteriological aspect of chronic rheumatism he feels sure of only one thing—that infection, or more likely infections of many kinds, are essential to its causation; how and why the joint changes result from the interaction of host and micro-organism is quite obscure. Mr. Joseph Race summarises the biochemist's contributions to the subject, and gives a good account of the blood sedimentation-rate; accelerated sedimentation is due to altered proportions or properties of the plasma proteins, which, he wisely says, are greatly in need of some more investigation. Dr. C. W. Buckley, the editor, writes a valuable little clinical account of ankylosing spondylitis, based on 150 cases in his own practice. After several shorter papers of less importance come four critical commentaries, by members of the committee, in which sections of the recent literature are surveyed and discussed: Mr. Timbrell Fisher deals with pathological and orthopædic work, Dr. G. H. Oriel with the general trend of research in 1934, Dr. Buckley with neurological manifestations of vertebral rheumatism, and Dr. Francis Bach with the thyroid and parathyroids. Finally there is a bibliography of chronic rheumatism in the medical literature of the last twelve months.

We have described the contents of the report in this detail because it deserves wide attention. The idea of clinical research by means of a sort of royal commission may not at first glance seem promising, but in this disease, of which we are nearly all weary through familiarity, the first need is to awaken a brisk interest, perhaps even to spur a complacent conscience. The second is to set the problem in some sort of perspective, indicating what knowledge has so far been won, what generalisations are most likely to hold good, and warning against will-o'-the-wisp theories and catchwords that have no meaning. Both those needs are faced in this first report, and the form in which it is cast—individual contributions instead of a formal report under headings—gives it an added appeal. Except for the secretary's paper on histamine, it says little about treatment; that is to come later. In some places the views of its contributors are open to criticism, but in the main it is informed with a sober enthusiasm. It should be read by all who feel any responsibility towards the teaching or the advancement of medicine, and it should help to convert all chronic arthritics in hospital beds and out-patient departments into "interesting cases."

DUODENAL EXTRACT IN DIABETES MELLITUS

SINCE the discovery of insulin there has been much speculation as to whether it is the only substance found in the body which influences the sugar metabolism. A substance having an insulin-like action has been isolated from the mucosa of the stomach and of the duodenum.[1] [2] Macallum believes that an insulin hormone is produced in the duodenum when sugar enters the intestines.[3] With Laughton and others[4] he studied the effect of a duodenal extract on dogs and rabbits; they found that it has no effect on a normal or a completely depancreatised dog, but that the partially depancreatised dogs were benefited when the substance was either injected subcutaneously or given by mouth. Duncan, Shumway, Williams, and Fetter[5] have now treated 30 diabetics with this extract. They took patients with mild and severe types of the disease and gave the extracts by mouth either when the patients were passing sugar or when insulin was discontinued having previously been given. Sugar-tolerance curves were performed at intervals on the milder cases. The authors conclude that the extract is of no value in reducing a distinct hyperglycæmia and has no effect when given with insulin. An effect, however, is discernible if both insulin and extract are given together for some days, and the insulin is then suddenly discontinued; if the extract had no value the glycosuria would reappear at once under these conditions, but it does not do so. A dose of 0·25 g. three times a day had as much effect as bigger doses. If the sugar tolerance is then tested, a normal curve may be obtained and this good result may persist for some weeks. The series treated included 12 cases of severe diabetes of which 8 showed a definite response, while 4 were unaffected; of 18 mild cases treated 11 were benefited while 7 did not improve. The inconstancy of these results is difficult to explain. Experiments in the treatment of diabetics are, however, always complicated by the capacity of both severe and mild cases to improve very considerably without any obvious cause. The results obtained by Duncan and his collaborators are thus by no means conclusive and can certainly not be accepted as proof of the presence of a special substance in the duodenum which is of value in the treatment of diabetes.

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[1] Reports on Chronic Rheumatic Diseases, being the Annual Report of the British Committee on Chronic Rheumatic Diseases appointed by the Royal College of Physicians. Number One. Edited by C. W. Buckley, M.D., F.R.C.P. x+172. Eight plates. 12*s.* 6*d.*

[1] Ivy, A. C., and Fisher, N. F.: Amer. Jour. Physiol., 1924, lxvii., 445.

[2] Dixon, W. E., and Wadia, J. H.: Brit. Med. Jour., 1926, i., 820.

MEDICAL EVIDENCE OF DRUNKENNESS

AT its last meeting on June 27th the Medico-Legal Society discussed the subject of drunkenness in the courts. Comprehensive papers were given by Mr. Everard Dickson, a metropolitan magistrate, and Dr. Gerald Slot respectively on the legal and the medical side of drunkenness. The subsequent discussion naturally centred round the vexed question of proving the drunkenness of a motorist who is charged under the Road Traffic Act 1930 with being under the influence of drink to such an extent as to be unable to exercise proper control of his car. There was general agreement that drunkenness has no one symptom which it does not share with other disorders. Dr. Slot gave some useful suggestions on differential diagnosis designed to enable police surgeons and others to distinguish between the effects of drink and those of nervous disturbance, either chronic or caused by the accident, or the effects of drugs or diabetes. The testing of the suspect motorist in the police-station is not by any means a simple matter, for though his breath may smell of alcohol, it will do this if he has taken the smallest quantity. It is possible that he may be slightly under the influence of drink but still capable of having proper control of his vehicle, and other causes may account for his appearing deeply intoxicated. It was agreed that tests which called for some unusual action, such as changing direction at the word of command, were unfair in any event, and two speakers recommended as a test for memory, orientation and ordinary common sense that the suspect should be asked to look up a number in the telephone book. Sir Bernard Spilsbury, who occupied the presidential chair for the last time, emphasised the possibility that shock might simulate intoxication; a motorist might be deeply shocked by a collision and be quite unconscious that he had suffered injury. On the legal side, as Mr. Justice Humphreys pointed out, medical tests in general carry far less weight than they would before a tribunal of medical men. Juries come to their conclusion largely on matters of fact, such as the amount of alcohol the accused had taken, the circumstances of the accident and his behaviour immediately afterwards. If conviction in a particular case depended upon the medical evidence, the jury, he said, were far more likely to give the man the benefit of the doubt. The view of the meeting appeared to be that a fairly severe degree of intoxication should be proved before the motorist was convicted, though this was not expressed in so many words by any speaker. It is rather curious that no one put forward the view, which has much authoritative support, that a very slight degree of alcoholism, not amounting to drunkenness in any sense, is capable of depriving many motorists of proper control.

THE TWO-SHIFT SYSTEM IN INDUSTRY

CLOSE on one hundred years ago a prolonged industrial battle was raging which terminated in 1847 in the Ten Hours Act—while Manchester protested that profits only came from the last two hours of the twelve-hour day. This Act limited to ten hours, between 5.30 A.M. and 8.30 P.M., the working day of protected persons—i.e., of women and anyone under 18 years of age. It was, however, so drafted that employers were able to introduce the relay system, whereby they claimed to be employing one set of protected persons the first half of the day and another in the last half. In fact, they often employed the same persons from 5.30 A.M. to 8.30 P.M.; detection was impossible because the workers colluded with the employers in giving false evidence. To meet this difficulty an amending Act was passed in 1850 limiting factory hours to between 6 A.M. and 6 P.M., or 7 A.M. and 7 P.M.; and this limitation still holds for protected labour. There never has been any limitation of factory hours for adult males, and at the moment there is not likely to be. The International Labour Conference at its nineteenth session last month had before it a general draft convention on the 40-hour week and approved it in principle. But its application depends on the adoption of separate conventions for individual industries, and it looks as if it will be long before the convention will have any practical bearing on factory hours.

As regards protected labour, a report[1] has just been issued in which an influential committee under the chairmanship of Sir Malcolm Delevingne unanimously praises the two-shift system which, since the war, has been permitted under Special Orders. It permits protected persons to be employed in two successive shifts (averaging not more than 8 hours each) between 6 A.M. and 10 P.M.; the shifts are usually 6 A.M. to 2 P.M. and 2 P.M. to 10 P.M. No substantial difficulties have arisen in enforcing compliance with the Orders made; certainly no return to breaches of the relay system has been experienced. The *two-shift system provides valuable elasticity in* the adjustment of plant to output; it enables costly machinery to be worked 16 hours a day, whereby it can be worn out before it becomes obsolete owing to new devices or changes in fashion; it permits advantage to be taken of a glut in supplies in seasonal trades, such as vegetable canning; and it does something to lessen unemployment without increasing expensive plant. In fact the more costly the plant, the more advantageous is the system. No medical evidence was forthcoming that the standard of health of shift workers was below that of day workers, or that they suffered in any way. But a suggestion is made for a fortnightly alternation of shift, since the sleep of those on the early shift tended to be curtailed, while that of those on the second shift was correspondingly lengthened. Much consideration is given in the report to evidence scientifically collected by the Industrial Health Research Board. Information obtained from the International Labour Office at Geneva indicates that other countries use the two-shift system advantageously far more than we do. The single alternative is overtime, which by common consent stands condemned, unless for some quite unforeseen rush.

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[3] Macallum, A. B., Senr.: Canad. Med. Assoc. Jour., 1929, xx., 46.

[4] Laughton, N. B., Macallum, A. B., Rabinowitch, I. M., and Watson, E. M.: Jour. Biol. Chem., 1931, xx., 92.

[5] Duncan, G. G., Shumway, N. P., Williams, T. L., Fetter, F.: Amer. Jour. Med. Science, March, 1935, p. 403.

[1] Report of Departmental Committee on the Employment of Women and Young Persons on the Two-shift System. 1935. London: H.M. Stationery Office. Cmd. 4914. Pp. 97. 1s. 6d.

The only objections of moment concern the disturbances to social life, due to early rising and lack of transport facilities for the early shift. Should, as is probable, the system come to be more widely used, these objections will naturally be overcome. Recommendations are made for embodying, under simplified official permission, this new shift system in the hours permitted under the Factory Acts; but, wisely, only where a high standard of service is maintained in canteens and messrooms, so that full benefit may be taken of the half hour allowed for meal time. Adoption of the recommendations will constitute an important landmark in the industrial life of this country.

THE MEDICAL ART SOCIETY

THE first annual exhibition of the Medical Art Society has now been opened; a private view took place in the Council room of the Royal Society of Medicine last Friday, June 28th. Fifty-four doctors showed their work and it was of a pleasantly varied sort. Undoubtedly the technical skill of some of the exhibitors was ahead of that possessed by others, but the impression derived from the whole display was that the general level was high and that a fair proportion of the work shown would have gained a place in shows where to paint was the professional métier. The exhibition consisted largely of paintings, *only 9 out of the 152 works being sculpture or wood*-work, and only 22 being black-and-white drawings. The rest of the exhibits were divided into 35 oil paintings and 86 water colours, and one or two of the exhibitors showed pictures in more than one class. The diversity both of aim and technique was, as might be expected, considerable, and this was equally noticeable in the oil paintings and the water colours. Several artists, not among the veterans, were more influenced by the style and aims of masters now thought to be old-fashioned, than were their elders; others who will be found among the seniors in age, appear to have turned more deliberately to modern schools for their guidance. The exhibition shows what was common knowledge, that many doctors look for relaxation in painting, and that some acquire real proficiency. The original scheme for founding the society mentioned specifically that medical illustrations would be included in its exhibition, but only one contributor to the show followed this hint. *The exhibition will remain open free of charge* until July 12th. The president of the Society, Sir Leonard Hill, and the honorary secretary, Prof. C. A. Pannett (131, Queens-road, Richmond, Surrey), are to be congratulated on the successful inauguration of an interesting movement, while particular thanks are due to Mr. Norman Sylvester, curator of the Russell-Cotes Art Gallery of Bournemouth, for his assistance.

PUBERTAS PRÆCOX

PUBERTAS præcox is a rare condition of which the ætiology is so little understood that a documented case report is of universal interest. At a meeting of the clinical section of the Royal Society of Medicine three years ago[1] Dr. H. S. Le Marquand showed a prematurely developed boy whose later clinical history with the pathological conditions found post mortem is fully set out in the Royal Berkshire Hospital Reports.[2] At his death the boy was four years and ten months old and he had been under observation from the age of two and a half years. At fourteen months the genital organs and pubic hair had begun to grow with abnormal rapidity, and from that time onwards there was a remarkable increase in height, weight, and muscular strength. Sexual symptoms appeared at one year and ten months and were excited by the presence of adult females. Mischievous and destructive in his habits, he showed a tireless activity, was abnormally strong for his age, and showed great interest in mechanical devices. When only two years old he attempted to drive the farm tractors while seated on his father's lap. He was not otherwise remarkable in intelligence or habits. Physical examination revealed nothing abnormal in the central nervous system, chest, or abdomen. Between the ages of two and three years two exploratory operations were carried out in the expectation of finding a suprarenal tumour, but none was found. Three months after the second operation it was observed for the first time that he made sexual advances to small girls, having formerly been attracted only by adults. His abnormal strength about this time is witnessed by his ability to push his father's motor cycle and side-car out of the shed on to the lawn, which he did after dark.

In May and June, 1933, when he was nearly four years old, the removal of one testis and of one suprarenal gland was carried out in two operations with a view to the alleviation of symptoms. As a result sexual activity became less marked in the succeeding months; it was also noted that the hair of his head became less coarse although, as before, it grew with remarkable rapidity. At the end of February, 1934, he developed rheumatic fever and this caused his death in the following April. Graphs of the increase in weight and height show a steady upward curve except for a slight set-back after the last two operations. Analysis also shows a relative retardation in the growth of the long bones from the thirty-first to the forty-third month, during which time development of the short bones was unabated. Radiograms at the fifty-eighth month show evidence of approaching closure of the epiphyses of the long bones so that, as Le Marquand says, "if the child had lived, a stunted dwarf, with an abnormally long upper measurement and short arms and legs, would have resulted." At necropsy the only significant lesion found by Dr. D. S. Russell was a tumour about the size of a hazel-nut firmly attached to the right corpus mammillare and the adjacent tuber cinereum and suspended in the interpeduncular space. The rest of the brain, including the pineal body, was normal. Histologically the tumour presented the appearance of normal brain tissue, with fully differentiated neurones and neuroglia and occasional bundles of myelinated fibres. The hypothalamus, examined by serial section, showed no abnormality. The only other histological observation of interest was the presence of active spermatogenesis in the testis.

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[1] Proc. Roy. Soc. Med., 1932, xxv., 106.

[2] Le Marquand, H. S., and Russell, Dorothy S.: Roy. Berks. Hosp. Rep., 1934–35, iii., 31.

The interpretation of such a case has obvious difficulties. The association of pubertas præcox with tumours of the pineal body was emphasised by G. B. Pellizzi and v. Frankl-Hochwart and supported by the observations of other workers who have tended to regard the syndrome, when so associated, as a manifestation of hypo-pinealism. But a growing collection of cases in which the condition accompanies a hypothalamic tumour with an intact pineal gland clearly shows that the theory of hypo-pinealism is unsatisfactory. In many of the reported cases the hypothalamic tumour has been so extensive that it has not been possible to indicate a critical site for the lesion in relation to the syndrome. In 1931, however, some French observers[3] reported a case that was remarkably similar to the one described by Dr. Le Marquand. They concluded that the syndrome was referable to a functional disturbance of the ventral part of the hypothalamus and of the mammillary bodies. This view is strongly supported by the present case and appears at present to be the only tenable hypothesis.

SODIUM AND THE SUPRARENALS

THE value of common salt in what has been called "medical shock" has been known for over a century, for in 1831 W. B. O'Shaughnessy used intravenous injections of physiological saline in treating cases of cholera which was then raging in Newcastle. Since that time beneficial results have been noted in many conditions which give rise to this syndrome, but it is only recently that its value in Addison's disease has been recognised,[4] although L. Soddu[5] found that salt solution prolonged the lives of adrenalectomised animals as long ago as 1898. R. F. Loeb, D. W. Atchley, and J. Stahl[6] have recently reviewed the relationship of sodium to adrenal insufficiency. Loeb showed in 1932 that the acute crises of Addison's disease were associated with a sharp fall in the blood sodium, that such crises could be precipitated by withdrawal of salt and mitigated by its administration. Experimental studies on adrenalectomised dogs showed a rapid fall in blood sodium after removal of the second suprarenal; this was accompanied by a drop in the chloride and bicarbonate and a rise in potassium and non-protein nitrogen. The sodium deficiency was due to a greatly increased urinary excretion, but the nitrogen retention could not be accounted for by the usual hypothesis of prerenal deviation of water as the urinary volume was above normal. The mechanism of this abnormal sodium excretion was investigated; it was found not to be due to liberation of some abnormal acid requiring fixed base for its elimination, as the urinary ammonia showed no rise; nor was it due to diuresis as the amount of sodium excreted was relatively greater than the amount of water. The authors fall back on the explanation that the suprarenal cortex controls sodium metabolism as the parathyroids do calcium. A point of interest which emerges from some unpublished experiments is that the biochemical changes following salt withdrawal in adrenalectomised dogs are identical in character with, though less in degree than those following withdrawal of cortin. Loeb and his colleagues reach the following conclusions which are of considerable clinical significance: that a low blood sodium, although constant in Addison's disease, is not diagnostic of it; that the diagnostic test of salt withdrawal as suggested by Harrop and others[7] is too dangerous to be used; that any intercurrent infection in a patient with Addison's disease increases the requisite maintenance dose of salt or cortin, thus forming a parallel with diabetes and insulin and tetany and parathormone; and finally that if adrenal insufficiency in man be not relieved by salt it will not be relieved by commercial cortical extracts in ordinary doses. This latter statement should act as an incentive to the production of extracts of greater potency, for it is still true to say that though much may be done for sufferers from Addison's disease, the majority of cases eventually die of the condition.

THE FUTURE OF PHARMACY

IN his presidential address to the British Pharmaceutical Conference last week the chairman, Dr. F. W. Crossley-Holland, briefly sketched the development of the modern pharmacist. Three hundred years ago, he said, there were three classes of people concerned in the care of the sick: the physician who prescribed, the apothecary who dispensed, and the chemist or druggist who supplied the drugs. In course of time, and after a struggle whose acrimonious repercussions echo in the pages of Culpepper, the apothecaries attained the right of prescription as well as of dispensing and became the forerunners of the modern family doctor. Neither the physicians nor the transfigured apothecaries established any professional or social contact with the vendors of drugs and "the heritage of the practice of pharmacy from the practice of medicine contains the elements of a former dislike and distrust." None the less, as Sir Henry Dale pointed out in his address to the Pharmaceutical Society early this year, there was for a long time the "most simple and natural cöoperation" between the pharmacist and the medical practitioner. Developments over the last quarter of a century are tending to change this relationship, for there is a continuous shrinkage in the prescription of the old-fashioned remedies compounded by the chemist himself. Sera, vaccines, and biological substances of many sorts play an increasingly important part in medicine, and in addition many synthetic drugs are available to take the place of older remedies; in the handling of all these the pharmacist plays the part of a distributor only. Dr. Crossley-Holland warned his hearers that this process is likely to continue and looked about for means of establishing a new link between the pharmacist and the practitioner of medicine. He regarded the falling-off in the demand for "drugs and galenicals" as bearing a relationship to the present "trend of medical thought and practice," this trend apparently being a preference for specific as opposed to symptomatic treatment.

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[3] Heuyer, G., Lhermitte, J., de Martel, and Vogt, Cl.: Rev. Neurol., 1931, ii., 194.

[4] See THE LANCET, 1934, i., 137; ibid., 1934, ii., 883.

[5] Lo Sperimentale, 1898, lii., 87.

[6] Jour. Amer. Med. Assoc., 1935, civ., 2149.

[7] Ibid., 1933, c., 1850.

Specific treatment demands accurate diagnosis, and looking about for means of establishing a closer rapproachement with the practitioners of medicine Dr. Crossley-Holland developed the thesis that pharmacists should turn their attention to medical diagnosis. "It would," he said, "be of the greatest assistance to the doctor if he could depend upon the pharmacist to undertake the examination of body secretions and excretions, to examine pathological urine and other morbid products . . . . carry out blood counts and generally to engage in the conduct of laboratory aids to diagnosis." But whether this is work properly to be undertaken by a pharmacist, however skilled in his own profession, is open to question. As Dr. Crossley-Holland said, it requires knowledge and manipulative skill; and though the pharmacist must possess the latter his present training is not calculated to fit him to deal with diagnostic problems. In fact nothing short of a full medical training can do that.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

WE have received a communication from Dr. R. Veitch Clark, president, and Mr. G. L. C. Elliston, secretary, of the Society of Medical Officers of Health, stating the policy of the Society undertaken in behalf of public health medical officers which they believe to have the approval of the public health service. The writers set out the aims of the Society, its services in behalf of the public and its members and its freedom from political bias. And they call attention to the coöperation existing between the British Medical Association and the Society, in view of the activities of a medical body, which they do not name, but which they assert is for the first time claiming to represent the interests of public health medical officers. The council of the Society, through the president and executive secretary, are therefore reaffirming their position, drawing the special attention of public health medical officers to a leading article on the subject which appeared in the *British Medical Journal* of June 1st (p. 1127). "They feel that it is of the utmost importance that both public health medical officers and local authorities should not be confused by the arbitrary action of another medical body in putting forward a new salaries scale and a new method of negotiation, the adoption of which is being urged upon medical men and local authorities on grounds not dis-associated from politics." The council believe that it is unnecessary to appeal to the loyalty of the fellows towards securing that their present objects and methods of action are adhered to. With regard to the main practical point in which the coöperation between the B.M.A and the Society of Medical Officers of Health exists, namely, that of the scale of salaries, a scheme arranging the scales was adopted in 1925, has been in existence ever since and has always been supported by THE LANCET.

SURVIVAL BY PERFUSION

HITHERTO the perfusion of isolated mammalian organs has been limited to experiments of short duration owing to the numerous conditions which militate against the indefinite maintenance of an artificial circulation. The difficulties lie not so much in the attainment of asepsis as in the gradual deterioration of the preparation from other causes; in an experiment which is only going to last for a few hours aseptic precautions are usually regarded, perhaps wrongly, as a waste of time. Either as a result of procedures to render it incoagulable, or because it is circulating in an unnatural environment, the shed blood used for the perfusion develops "toxic" properties which lead to progressive vasoconstriction and œdema in the isolated organ. For this reason lungs are usually inserted in the circuit to "detoxicate" the blood, but they also become œdematous in time; J. de B. Daly believes the toxic properties to be due to the precipitation of some solid material which is filtered out by the lungs, and has successfully replaced these by filters, but it is doubtful whether this is a complete solution of the problem. Another important factor is the intermittency of the circulation. It is well known that a mere head of pressure equal to the arterial pressure is useless for prolonged perfusion, and that a pulsatile flow must be provided. Owing to the almost inevitable inclusion of rigid glass tubes in the circuit, it is impossible to guarantee that a mechanical pump will reproduce the heart beat exactly from the point of view of the organ; moreover, although immense improvements in perfusion pumps have been made, a certain degree of trauma to the blood is inevitable, and this may have something to do with the development of its toxic properties. Therefore as we pass from the heart-lung to the pump-lung, and from this to the pump-oxygenator circuit which contains no vital tissue except the organ under investigation, the difficulties of even short perfusions increase enormously. Even when "successful" the organ is not necessarily working normally; thus the kidney secretes urine, but it is not normal urine. These are but the outstanding and well-recognised difficulties, and the claim recently reported from Dr. Alexis Carrel's laboratory in the Rockefeller Institute, New York, that organs have been kept alive under artificial conditions for as long as twenty days implies that the additional problem of elimination of metabolites has been solved and that one of the most sensational advances in the history of physiology has been made. The details of the Carrel-Lindbergh "life-chamber" will be awaited with keen interest to all those engaged in the study of normal and abnormal function.

THE Dr. Jessie Macgregor triennial prize in medical science has been awarded to Dr. Mary Broadfoot Walker, of St. Alfege's Hospital, London, for her work on physostigmine in the treatment of myasthenia gravis.

THE death is announced at Philadelphia of Prof. Thomas McCrae, physician to the Jefferson and Pennsylvania Hospitals, Philadelphia, whose collaboration with Sir William Osler in the production of the "System of Medicine" has made his name deservedly familiar to the medical world. Prof. McCrae was 65 years of age.

A DOMINION LUNCHEON.—Three medical men who have held, or are holding, high office in the Dominions—namely, Sir Stanley Argyle, late Premier of Victoria, Dr. H. A. Bruce, Lieut.-Governor of Ontario, and Mr. S. M. Huggins, Prime Minister of Southern Rhodesia—were entertained at a luncheon given at Grosvenor House, Park Lane, on June 27th, by officers of the British Medical Association. Those present included Mrs. Bruce, Lord Dawson, Sir Humphry Rolleston, Sir George and Lady Badgerow, Sir Harry Batterbee, Sir Henry and Lady Brackenbury, Sir Thomas and Lady Dunhill, Sir Thomas Stanton, Sir Holburt Waring, Dr. and Mrs. G. C. Anderson, Mr. and Mrs. Rowley Bristow, Dr. Alfred Cox, Dr. and Mrs. J. S. Fairbairn, Mr. and Mrs. L. Ferris-Scott, Mr. and Mrs. Bishop Harman, Dr. C. O. Hawthorne, Dr. and Mrs. Robert Hutchison, Dr. and Mrs. E. K. le Fleming, Dr. and Mrs. W. Paterson, Dr. S. Watson Smith, and Mr. H. S. Souttar.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LIX.—PROGNOSIS IN STREPTOCOCCAL INFECTIONS OF THE SKIN

In a consideration of eruptions caused by streptococcal infection two groups must be differentiated: (1) those due to invasion of the skin by living and actively multiplying organisms; (2) those which are cutaneous reactions to streptococcal toxin, absorbed from some focus of infection, or to the organisms themselves circulating and reaching the skin in the blood stream. The latter group I have termed streptococcides (THE LANCET, 1921, ii., 483), thus bringing them into line with the tuberculides, trichophytides, and levurides, although Sabouraud has unfortunately employed this term to indicate certain *external* streptococcal infections.

In this article the first group only will be considered. Unlike certain strains of staphylococci (*Staph. cutis communis*), streptococci are not normal habitants of the skin, although some varieties are constantly present on the mucous surfaces of the mouth, throat, and intestine (*Strep. salivarius, fæcalis, &c.*). Like the more virulent strains of staphylococci (*Staph. pyogenes aureus*), however, pathogenic streptococci (*Strep. pyogenes longus*) are frequent invaders of the skin, where they may cause lesions of various types. Certain differences between staphylococci and streptococci as regards their infection of the skin may be tabulated as follows:—

STAPHYLOCOCCI	STREPTOCOCCI
1. Some strains may be considered as natural habitants of the skin.	1. Are more likely to invade the skin either from some previous host, or from mucous membranes.
2. Tend to involve the pilo-sebaceous follicles, so that most staphylococcal eruptions are primarily follicular.	2. Have no predilection for the follicles, but tend to involve the natural folds of the skin and the muco-cutaneous junctions, and to cause fissures.
3. Do not, as a rule, cause lymphangitis or adenitis.	3. Are prone to invade the lymphatics and cause adenitis.
4. Are powerfully chemiotactic for polymorphonuclear leucocytes, thus producing "laudable pus."	4. Are less pyogenic, and tend to provoke an exudation of serum, containing only a few cells.
5. Staphylococcal lesions usually remain *pure*—i.e., do not become secondarily infected with other organisms.	5. Streptococcal lesions always become secondarily infected with staphylococci.

The following streptococcal affections of the skin will be considered: (1) impetigo contagiosa; (2) impetigo pityrodes; (3) ecthyma; (4) intertrigo; (5) fissure; (6) erysipelas (acute); and (7) recurrent streptococcal lymphangitis or relapsing erysipelas.

Many writers include the bullous impetigo of the newly born, or pemphigus neonatorum, among the cutaneous streptococcal infections, but a number of careful independent observations tend to incriminate the *Staphylococcus aureus* as the causal organism (T. H. C. Benians and B. H. Jones: THE LANCET, 1929, i., 174).

IMPETIGO CONTAGIOSA

This is caused by a superficial invasion of the skin by a *Streptococcus pyogenes longus*, the site of infection being just beneath the horny layer. In most cases the disease runs an acute and self-limiting course of some three to six weeks' duration, recovery taking place spontaneously owing to the gradual development of immunity to the infecting streptococcus. I am aware that this statement will be challenged by many, particularly by the advocates of this or that method of local treatment, but in the acute attacks to which I refer I have not discovered any topical application that will entirely prevent the appearance of new lesions. When I was in the Persian Gulf in 1916 at the hottest time of the year I had a very severe attack of impetigo, and all my therapeutic efforts were in vain, for new lesions continued to appear over a period of several weeks. Within forty-eight hours of my arrival in Bombay, however, striking improvement was manifest, and recovery was rapid. On the other hand, I believe that it is possible to abort an attack in the early stages by giving either a few intramuscular injections of Aolan, or a mixed streptococcal and staphylococcal vaccine at short intervals.

It is important to remember that impetigo contagiosa of the beard or moustache regions in men may result in a sycosis, the secondarily invading staphylococci becoming established in the hair follicles, and this risk must be combated not only by suitable local treatment, but also by measures designed to raise the patient's resistance to pyogenic infection. In certain cases recovery from an acute attack of impetigo is incomplete, a few persistent and indolent lesions remaining and being often associated with chronic streptococcal fissures in the natural folds—e.g., in the retro-auricular space, or at a muco-cutaneous junction, such as the angles of the nostrils or the labial commissures. An out-of-door holiday in a bracing climate and a generous vitamin-rich dietary will usually succeed in these cases.

IMPETIGO PITYRODES

It is to Sabouraud that we owe the recognition of this dry, attenuated form of impetigo. It is usually situated on the face, and the lesions consist of dry, furfuraceous patches of circular or irregular contour. Probably the majority of cases of the *dartre volante* or "tetter" of older authors were impetigo pityrodes. They are met with towards the end of an attack of ordinary impetigo, and one may see in the same patient all stages, from the crusted, oozing lesions, to the dry, scaly patches referred to. They are, however, also common in children suffering from chronic nasal catarrh, in whom there has been no definite attack of ordinary impetigo, and are then frequently associated with streptococcal fissures at the angles of the nostrils or mouth. Their occurrence is predisposed to by the use of strong alkaline soaps, which damage the protective horny layer, but such soaps may of themselves give rise to dry, scaly patches apart from infection. Impetigo pityrodes is contagious, and many epidemics of it have been described. It has to be differentiated from the scaly patches caused by the pityrosporon of Malassez, which are usually seen in older children and adults, and from the eczematoid form of lichen scrofulosorum (dermatitis scrofulosa).

This attenuated form of impetigo is often much more resistant to treatment than the acute variety, probably because the mildness of the infection does not stimulate the defensive reactions on the part of the host necessary to produce immunity. It is well known that spontaneous recovery usually occurs if the patient be sent to some bracing place on the east coast, and I am convinced that a diet relatively rich in carbohydrate, with an inadequate supply of protein and of vitamin-containing foods, is a predisposing factor in this condition, as it is in the chronic catarrh of the upper respiratory tract that so often accompanies it. As regards local treatment, I have found that painting the patches daily with a 1 per cent. solution of iodine in spirit, followed by the application of an ichthyol cream or paste is effective. Alkaline soaps should not be used for washing the face.

ECTHYMA

This is merely a deep form of impetigo in which destruction of the epidermis occurs and an ulcer results; consequently the lesions leave scars after healing. They occur usually on the legs, and circulatory stasis is an important contributory factor, so that they are common in persons with acro-asphyxia, and on varicose legs, where they may be the starting point of chronic varicose ulcers. During the war ecthyma was a very frequent complication of pediculosis, and the *Streptococcus fæcalis* was often the infecting organism (H. MacCormac). The lesions will usually heal under antiseptic applications—e.g., a 1 in 4000 solution of perchloride of mercury applied as compresses after removal of the crusts. In obstinate cases, where as a rule the patient is debilitated, exposure to sunlight or the ultra-violet rays is of value.

INTERTRIGO AND STREPTOCOCCAL FISSURE

With the relapsing lymphangitis to which they predispose, these are the commonest chronic conditions caused by streptococcal infection of the skin. They may, indeed, be regarded as the cutaneous manifestations of chronic streptococcal infection of epithelial structures, which is one of the most difficult of all diseases to cure. As an example, the following case, already described by me in the Guy's Hospital Reports, 1931, lxxxi., 92, may be quoted :—

> A lady, aged 28, had scarlet fever at the age of twelve, and from that time had suffered more or less continuously from so-called "eczema" of the ears. She has had five attacks of erysipelas of the face. Before her marriage there was some leucorrhœa, and, since the birth of one of her two children, there has been a thick vaginal discharge. Unless this is checked with a cotton-wool plug she develops "eczema" of her groins. She has also periodically had the "eczema" in the submammary folds. On examination she was found to have (1) typical retro-auricular intertrigo, obviously of streptococcal origin, with chronic *meatitis*; (2) at the upper angles of the nostrils were the remains of streptococcal fissures, doubtless the portals of entry of infection responsible for her attacks of recurrent erysipelas. The "eczema" of her groins and submammary regions to which she was subject were clearly also streptococcal intertrigo. The vaginal discharge was found by Mr. F. Cook to be due to a chronic cervical erosion. Prof. Eyre recovered a *Streptococcus pyogenes longus* with other organisms from the retro-auricular intertrigo and the nasal fissures.

This case illustrates very well the persistence over a period of sixteen years of a streptococcal infection of the skin dating from an attack of scarlet fever. The patient was very lucky in that her repeated attacks of erysipelas, arising from neglected nasal fissures, did not lead to permanent blockage of the lymphatics of the malar regions and eyelids. The patient's sister was also under my care for chronic retro-auricular intertrigo.

The prognosis as regards cutaneous lesions in chronic streptococcal infection is more favourable than where the mucous membranes are involved, but even so relapse is common, particularly in those who are compelled to live sedentary indoor lives. As has already been indicated, I believe that diet and environment are important factors, and I am convinced of the value of vaccine therapy, if it is employed judiciously and for a sufficient length of time. An important point is that the local treatment of intertrigo and fissure must be continued until a normal epithelium has been re-established, for otherwise relapse is certain.

ACUTE ERYSIPELAS

Severe cases of erysipelas, ending sometimes fatally, are less common than formerly, and I do not think that this is entirely due to more effective treatment. Possibly the diminution of chronic alcoholism may be partly responsible. A. Rendle Short (Index of Prognosis, 1915) states that the mortality in 875 cases at St. Bartholomew's Hospital, collected several years ago, was 3·5 per cent. In cases in which there was an accompanying cellulitis it was much higher—11 per cent. in 889 cases. W. H. Guy (Jour. Cut. Dis., 1919, xxxvii., 399), D. Symmers and K. M. Lewis (Jour. Amer. Med. Assoc., 1927, lxxxix., 880) and others have emphasised the therapeutic value of streptococcal antitoxin. H. Semon has recorded the remarkable effect of intramuscular injections of aolan in a case in which a fatal result had been anticipated, and in recent years I have employed this method of treatment in several cases of varying severity with uniformly good results. In the absence of unfavourable conditions, such as alcoholism, diabetes, chronic renal disease, long-standing malnutrition, and cachexia, the prognosis in acute erysipelas may be regarded as very favourable.

RECURRENT STREPTOCOCCAL LYMPHANGITIS (RELAPSING ERYSIPELAS)

This is one of the most important and serious complications of chronic streptococcal infection of the skin, because the repeated invasion of the lymphatics may eventually cause their blockage, giving rise to persistent elephantiasis and consequent disfigurement. The streptococcal fissure is the usual portal of entry to the lymphatics. When these occur between the toes, they are usually secondary to epidermophytosis. They may cause recurrent attacks of lymphangitis of the feet, ankles, and legs, the origin of which is often overlooked. I have recently seen two cases in which permanent blockage of the lymphatics with the production of elephantiasis had occurred from this cause, and in both the interdigital fissures and mycotic infection had been disregarded. The importance of thorough treatment of interdigital epidermophytosis is thus manifest, since it may in this way be indirectly responsible for permanent, though partial, disablement.

Recurrent lymphangitis, however, most frequently occurs on the face, giving rise all too often to persistent elephantiasis ("solid œdema" of Hutchinson). This condition has long been recognised under various terms—e.g., erysipelas perstans faciei (Kaposi), erythema perstans faciei (Kreibich), lymphangitis faciei (Mackenzie). The parts affected are usually the malar regions and the eyelids, and exposure to cold is certainly a factor predisposing to the attacks. In the great majority, if not in all cases, the portals of entry for infection of the facial lymphatics in this area are fissures at the angles of the nostrils. I am aware that cases have been recorded in which it was stated that no such fissures were apparent, but I believe that a careful examination with a strong light of the nasal vestibules at the time of the attacks will almost invariably reveal them, and, as a rule, they are seen even in the intervals. They are often associated with impetiginous anterior rhinitis, chronic nasal and nasopharyngeal catarrh, and sometimes with sinusitis. Their treatment is of paramount importance, since a repetition of the attacks of lymphangitis will in time inevitably lead to lymphatic blockage and permanent disfigurement. Less commonly, relapsing erysipelas involves the ear, neck, and side of the face, and is then due to chronic or recurrent fissures below the lobe of the ear, or in the retro-auricular space. Involvement of the lips may occur from chronic fissures at the labial commissures (*perlèche*), or in the centres of the vermilion borders.

The prognosis is in these cases good, providing that persistent blockage of the lymphatics has not already occurred. Thorough treatment of the fissures with a silver nitrate paint and a mercurial ointment or paste should be carried out until a normal epidermis has re-formed. In obstinate cases a few fractional doses of X rays are sometimes helpful. Even when blockage has not yet occurred, local treatment may well be combined with injections of an autogenous or a mixed stock streptococcal vaccine, which in my opinion give better results if made intradermally. In my experience these cases are extremely sensitive to the vaccine, and even very small doses are likely to produce a local necrosis at the site of the intradermal injections and a flare up of the lymphangitis.

When persistent lymphatic œdema is already established the prognosis is much less favourable. In some cases, however, I have had good results with intradermal injections of streptococcal vaccine, given over a long period in gradually increasing doses. In America injections of *Streptococcus erysipelatis* toxin have been favourably reported upon in these cases, and G. C. Andrews (Diseases of the Skin, Philadelphia, 1930) states that they are "a specific method for the prevention of recurrences and the reduction of persistent lymphœdema in cases of chronic recurrent erysipelas."

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SPECIAL ARTICLES

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

THE twenty-first annual conference of this association was held at Southport from June 27th to 29th, under the chairmanship of Sir ROBERT PHILIP, the general subject for discussion being the

Responsibility of the Nation towards the Child in Respect of Tuberculosis

Dr. G. LISSANT COX (Lancashire) said it might readily be supposed that the sub-standard child, as compared with the normal child, was more likely to be infected by, and die of, tuberculosis either as a child or later as an adult. This did not appear to be so, as a special survey made in Lancashire had shown. But since infection might lead to disease, it was of the greatest importance to safeguard the child. It was known that under certain conditions there was a very high non-pulmonary tuberculosis death-rate in young children subject to infection from mother or father. Further, in an investigation into "contacts," it had been shown that at least 15 per cent. of known cases of pulmonary tuberculosis gave rise to secondary cases, in spite of modern antituberculosis measures, the average interval between the discovery of primary and secondary cases being 3½ years. The three factors on which methods of prevention were based were isolation, immunisation, and environment. In Lancashire they had taken as their basic principle the words: find, isolate, educate, and treat the *adult positive case.* They had always concentrated on the adult positive case, believing that this safeguarded the child. Dr. Cox briefly described the various methods of isolation—the Grancher system, hospital or sanatorium isolation, or village settlements for the whole family. With regard to the provision of hospital isolation, the number of beds which should be available throughout the country was one for every death from tuberculosis. At present only a very small minority of tuberculosis workers in this country advocated inoculations for immunisation, and the speaker thought that the present state of knowledge did not warrant a large or routine use of this method of safeguarding children against infection. The principle of environment was at least as important as that of isolation. It had been shown conclusively that a higher standard of living and of housing was a direct safeguard against infection, and to this factor was largely due the great diminution which had already occurred in the incidence and mortality of tuberculosis.

Dr. M. SKOKOWSKA-RUDOLF (Warsaw) pointed out that the two peaks of tuberculosis mortality in childhood were in the first year of life (decreasing during the 3–7-year period), and in adolescence. Preventive efforts should be directed chiefly towards these two periods. Poland had adopted Calmette's system of B C G vaccination, while among other suggested provisions for the protection of tuberculous children and those in danger of infection were the following: (1) to instal for every 100,000 of the population three pairs of beds for expectant mothers (suffering from tuberculosis) and their infants, in order to allow of proper B C G vaccination and instruction of the mothers in nursing their babies; (2) to instal 12 beds for every 100,000 of the population for inoculated children; (3) to provide a minimum of 5 hospital beds for tuberculous children of pre-school age (3–7 years) for every 100,000 of the population; (4) to provide 10 sanatorium beds for every 100,000 of the population; (5) to create forest school preventoriums for children of school age, taking as standard 40 beds for every 100,000 of the population; and (6) to instal as auxiliary establishments "half sanatoria" (day and night sanatoria). These institutions were already doing good service in the big cities of Poland, children from tuberculous families spending the greater part of the day in them.

BOVINE TUBERCULOSIS

Major A. B. MATTINSON, F.R.C.V.S., spoke particularly on infection through the milk-supply. Assuming as approximately accurate the statements that any cow giving tuberculous milk to-day would be dead within a year, that any cow affected with tuberculosis to-day would be dead in five years, and that almost every cow which would be giving milk in 1940 was either unborn or was at present free from tuberculosis, certain lines of progress were indicated, including an overhaul or at least a tightening up of the various Acts and Orders. Major Mattinson outlined many ways in which the incidence of clinical bovine tuberculosis might be brought under control, urging adequate veterinary supervision of dairy herds with the object of reducing clinical—and not merely mammary—tuberculosis at its earliest manifestation.

Dr. NATHAN RAW (London) said that while no animal could be given an immunity to a lethal dose of virulent bacilli, it could be given an immunity sufficient to resist a mild form of infection, which was the usual method by which the animal was attacked. The immunisation of calves was simple, the method Dr. Raw adopted being the injection of

GENERAL CONSIDERATIONS

In 11 of the 22 cases of gold purpura a previous course of aurotherapy had been given, and this is suggestive of sensitisation. The small precipitating dose in our case of gold purpura is in favour of this view, and it is clear that the initial doses of a repetition course should be given with caution.

Probably there is some idiosyncrasy or abnormal sensitivity to these drugs. Simple toxicity of the compounds is ruled out, for some patients will tolerate nearly a full course, whilst others will tolerate one course and evince symptoms early in a second. French authorities lay great stress on family and clinical histories showing evidence of idiosyncrasy or allergy and advise against giving these drugs where there is a history of—e.g., asthma or urticaria. There was no history of any of these abnormalities in either of the cases recorded here.

Purpura in tuberculous patients treated with gold has been attributed to tuberculous bacillæmia, but Weil [1] could find no report of bacilli having been cultured from the blood investigated from this point of view. It has also been suggested that the gold may liberate tuberculous toxins, but there is no evidence that the drug acts in this way.[5]

The way in which the hæmorrhagic state is produced remains doubtful. Apparently it is not due to the anticoagulative properties that these compounds have on blood in vitro; for in the pamphlet enclosed in the sulfarsenol carton, under the heading "blood transfusion," it is recommended that 0·06 g. of sulfarsenol should be added to each 100 c.cm. of whole blood, so as to dispense with sodium citrate and give the patient the advantage of a dose of arsenic. I am unable to find a record of purpura caused in this way. Gold compounds have the same property, for Tzanck [6] says that 0·1 g. of allochrysine will prevent coagulation in 100 g. of blood in vitro; but Weil,[1] using a rabbit, found that only Solganol A. was the only one which diminished coagulation in vivo.

Sex-incidence is about equal: of 19 cases of arsenobenzol purpura 9 were in women,[4] and of 22 cases of gold purpura 14 were in women. Age, again, seems to have no influence, for two patients were over seventy and another was eighteen; nor has the general condition of the patient, for purpura has developed in patients treated for a small lesion of lupus, whose general condition was good.[8]

Various prodromal symptoms may occur—e.g., general malaise, nausea, headache, diarrhœa, and itching. Of the 22 cases of gold purpura 12 had prodromal symptoms, of which itching was the commonest. The interval between the last injection and the appearance of purpura varies, but the onset is sudden. In the second case, recorded above, it was only four hours. In Case 1 it was forty-eight hours. There have been one or two cases in which the purpuric or the agranulocytic syndrome has arisen up to five months after the last injection of gold [9 10]; and although this may be accidental it has happened often enough to suggest that the sequel was due to the drug. In both the cases reported here the oral and nasal hæmorrhages were so severe that blood from this source obscured any intestinal hæmorrhage.

In neither case was there any hepatic enlargement or jaundice; both complained of the extreme weakness usually associated with the agranulocytic syndrome. Neither showed eosinophilia. Lacapère [11] says that an eosinophilia of more than 6 per cent. before or during treatment should indicate caution in the the use of gold, while Houghton [12] found an eosinophilia of over 20 per cent. in every case developing a gold rash. In 10 cases of gold purpura in which a blood count was recorded, the eosinophilia was not high, and in only 2 cases[7 13] was it over 4 per cent.—i.e., 6 per cent. and 13·5 per cent. Recently Loewy[14] has published 4 cases of purpura hæmorrhagica following the use of Sedormid; the eosinophils were 27·8 per cent. and 9·4 per cent. in the 2 cases where a blood count was recorded.

Eosinophilia does not seem to be a conspicuous feature of arsenobenzol purpura and none of Bamforth and Elkington's 4 cases showed it.

PROGNOSIS

There were 10 deaths among the 19 patients with arsenobenzol purpura[4] and 10 among the 22 with gold purpura; so far the prognosis in the two types is much the same. In both the cases I report there was complete recovery, although the history and general condition was similar to that of many fatal cases. The red cells are always reduced in number, it may be below 2,000,000, and the hæmoglobin percentage is not always correspondingly low in the early stages. The extreme anæmia is not entirely due to loss of blood, though some patients, especially women, lose large quantities. Actual red cell destruction, as well as aplasia, probably takes place, and consequently the presence of polychromasia, reticulated red cells, nucleated red cells—all of which indicate bone-marrow activity—are good prognostic signs. Platelets are always reduced in number and may be absent, but our cases show that this does not influence the prognosis. Both our patients showed a leucocytosis and the ratio of granular to non-granular cells was always high. Leucopenia, as evidence of aplasia of the bone-marrow, carries a grave prognosis, the gravity rising with the proportions of non-granular to granular cells. This, with the degree of leucopenia, is the most important factor in estimating the outcome of a given case, although death may occur from cerebral hæmorrhage.

PROPHYLAXIS

The only efficient safeguard is systematic platelet counts, but the tourniquet test applied at each visit has been found useful (Hinault and Braillon [7]).

TREATMENT

Treatment should be started forthwith. Although no fresh spots appear and the hæmorrhage is lessening, procrastination is dangerous, for there may be a sudden severe exacerbation progressing to collapse and death. Blood transfusion is the most satisfactory method of arresting the hæmorrhage, and a large transfusion of 500–600 c.cm. seems to be better than repeated small transfusions. Before transfusion in our cases, we tried, without apparent effect, various remedies such as serum and liver. On the other hand in Lavastine and Reyt's case [15] the hæmorrhage stopped after a blood transfusion, but the patient's general condition failed to improve until she was given liver. All other accessory treatment had proved futile.

In view of the possibility of gastric hæmorrhage the diet should be soft, easily digestable, and supplemented by minced liver, liver extracts, and fluids containing at least four ounces of glucose daily. The liver—especially as we do not know its exact part in blood formation—should be protected, if possible, and it is therefore well to give 40 or 50 c.cm. of 25 per cent. glucose with the blood transfusion. Frequent injections should be avoided; they may lead to further hæmorrhage at the site of puncture. If there is evidence of agranulocytosis it is worth while giving sodium nucleinate or pentose nucleotide.[16] In Coste and Cahen's[12] agranulocytic case sodium nucleinate 0·5 c.cm. every other day produced a rapid response with ultimate recovery.

SUMMARY

Two cases of hæmorrhagic thrombocytopenic purpura are reported, the causative agents being gold and arsenical compounds. Other recorded cases are reviewed, but no definite reason for this complication is found, though an idiosyncrasy or abnormal sensitivity of the patient is the probable cause. The eosinophilic response present in other complications of gold therapy is less obvious in the purpuric cases; in only 2 recorded cases was it above 4 per cent. No effective prophylactic measures are known, but a history of allergic or other abnormal responses should engender caution. Blood transfusion is the most effective means of treatment; liver extracts may be given to aid blood regeneration. The white cell count is the most reliable guide to prognosis.

My thanks are due to Dr. J. Burnford and Dr. F. G. Chandler for permission to publish the two cases, and to the laboratory staff of the West London Hospital and the Victoria Park Hospital for their help.

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BIOLOGICAL ACTIVITY OF DERIVATIVES OF THE MALE HORMONE ANDROSTERONE

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AND

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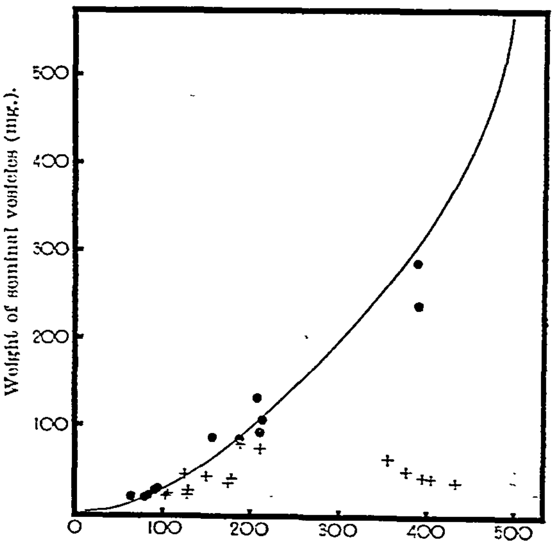
IT has already been shown[1] that solutions of the crystalline male hormone androsterone injected into rats will maintain normal prostate and seminal vesicles after adult castration and will produce growth of the rudimentary glands in animals castrated before puberty. Androsterone, therefore, in sufficient doses will replace the secretion of the testis, but for two reasons it was concluded that this substance is not the actual testis hormone:—

(1) It is less effective in producing growth of the seminal vesicles than of the prostate. This was seen most clearly after 28 days' injection, when the prostate was large whereas the seminal vesicles had only grown slightly (see Table and Figure).

(2) A given number of capon units of androsterone were much less active on the accessory glands of castrated rats than the same number of capon units of a particular urine concentrate.

In view of these facts it seemed desirable to test two derivatives of androsterone which by analogy with the œstrus-producing hormone might be expected to be more effective on rats: (*a*) the reduction product of androsterone, the so-called dihydroandrosterone,[2 3 4] preferably called andradiol, and (*b*) the benzoate of androsterone.



The curve shows the relation between prostate size and seminal vesicle size in normal rats. The points show the relations between these glands in pre-puberally castrated rats receiving the largest doses of androsterone (+) and andradiol (●) used in this work.

Andradiol is reported[2 3 4] to be about three times as active on the capon comb as androsterone. In agreement with this, a test in this laboratory gave a unit of 33 gamma for andradiol as compared with 100 gamma for androsterone. The Table shows the results of four experiments carried out on pre-puberally castrated rats with andradiol, and also those of five similar experiments with androsterone and one with androsterone benzoate. All details of technique are given in the previous paper.[1] It is clear from these experiments that andradiol, unlike androsterone in the dosage used, produces normal growth of the accessory glands of the pre-puberally castrated rat; the seminal vesicles grow pari passu with the prostate, and there is a normal relation between the size of the two glands (see Figure).

Table showing Average Weights after Fixation of Prostate and Seminal Vesicles in Control and Injected Rats Castrated before Puberty

No. of rats.	Daily dose mg.	Days in-jected.	Total capon units.	Average weight (mg.) of—	
				Prostate.	Seminal vesicles.
16	Controls.	—	—	16	4
6	0·6 androsterone in oil.	10	60	64	14
5	1·0 ,, ,,	10	100	112	32
5	2·0 ,, ,,	10	200	129	26
5	2·0 androsterone in alcohol.	10	200	170	56
5	1·0 androsterone in oil.	28	280	394	46
5	0·25 andradiol in oil.	10	75	63	22
5	0·5 ,, ,,	10	150	82	22
5	1·0 ,, ,,	10	300	199	101
2	1·0 ,, ,,	20	600	389	253
5	0·5 androsterone benzoate in oil.	10	—	17	5

In this respect, therefore, andradiol appears to resemble the testis hormone; but nevertheless it must be placed in the same category as androsterone owing to its low activity per capon unit on rats compared with that of the urine concentrate "Enarmon." Actually it would appear from the Table that andradiol is less active per capon unit on the rat prostate than androsterone, though rather more active per milligramme of the pure substance. On the seminal vesicles, however, after the initial lag in their growth has been passed, andradiol is much more active both per capon unit and per milligramme than androsterone, though still not as active as the urine preparation.

It follows that the high activity of "Enarmon," or of testis extracts, is not due to the presence of andradiol. This agrees with the report by the Amsterdam workers[5] of the isolation from testis of a substance, of as yet uninvestigated constitution, which is ten times as active as androsterone in capons, and which, when combined with a tissue extract, *is said to be very active on rats.*

Androsterone beznoate.—In the first test, carried out on a group of 5 capons, it was found that 272 gamma of androsterone benzoate (equivalent to 200 gamma of androsterone) given daily for five days produced negligible growth of the comb one day after the last injection. In a further test, carried out on a single capon 1·36 mg. daily (equivalent to 1 mg. of androsterone) for five days produced 5 mm. increase in length and height one day after the last injection—i.e., an effect similar to that produced by 100 gamma of androsterone. Comb growth was continued however for some time after the end of injection. The rat test on the benzoate gave completely negative results (see Table).

The increased activity of œstrone benzoate is probably due to its hydrolysis by the organism at an optimal rate. The inactivity of androsterone benzoate would indicate, however, that it is hydrolysed very slowly. Such a difference between the rates of hydrolysis of œstrone and androsterone benzoates may be correlated with the fact that the former is the ester of a phenol, whilst the latter is the ester of an alicyclic secondary alcohol. Further work is to be carried out on this subject. Analogous differences in rates of enzymic hydrolysis of phosphoric esters are known.[6]

We are much indebted to Prof. Ruzicka and to Messrs. Ciba for the supply of andradiol.

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CLINICAL AND LABORATORY NOTES

A METHOD OF BLEEDING TRANSFUSION DONORS

By H. L. Marriott, M.D., M.R.C.P. Lond.

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Anyone with much experience in bleeding transfusion donors knows that it is sometimes hard to obtain several hundred cubic centimetres of blood. The method about to be described has been the standard one at the Middlesex Hospital for a year, and has rendered blood collection much easier. We have particularly found it of service in connexion with our method of continuous drip transfusion described in The Lancet of April 27th.

Difficulty in obtaining blood by needle methods arises, as a rule, either from failure to insert or maintain the needle in the lumen of the vein, or from formation of a clot within the needle. Given a sharp needle, reasonable veins, and average skill on the part of the operator, the trouble is usually from clotting in the needle. The flow begins briskly, but soon diminishes and finally stops. Our method aims at removing this difficulty by accelerating the flow of blood so that it has no time to clot. The acceleration is secured by aspirating the blood by a *strong* pump.

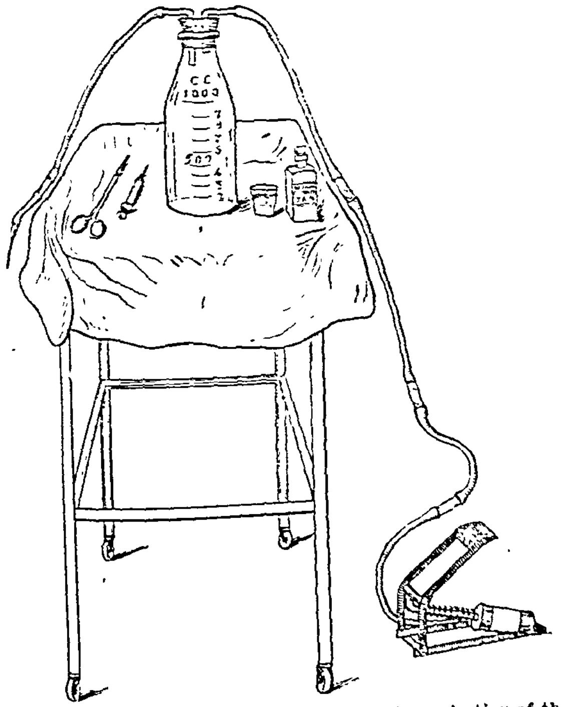
Aspiration is not a new principle, but the pumps employed have generally been weak, such as rubber bulbs of the Higginson pattern or Potain-type pumps. We employ a Dunlop "Junior" motor-car tyre foot-pump (price 18*s.* 6*d.*) with its valve reversed so that it sucks instead of blows. This pump easily provides a negative pressure of 12 inches of mercury. It has also the advantage of being foot-operated. The difference in the rate of flow made by strong suction has to be seen to be believed. It is usual to complete the collection of 500 or 600 c.cm. of blood within five minutes; a flow of less than 50 c.cm. per minute indicates that the needle is not truly in the vein. If the needle is properly inserted, the strong stream does not falter, and there is a temptation to remove too much blood because of the ease of the method.

The safe limit for blood removal by any method is *50 c.cm. per stone, or 8 c.cm. per kg. of body-weight* for healthy donors. In our experience of hundreds of cases rapid removal causes considerably fewer reactions than slow, because, provided the above limit is observed, any reaction that occurs in withdrawing blood is psychological and not due to blood loss. The psychological factor is proportional to the time taken. It is increased by prolonged manipulation, suggesting to the donor that the operator is in difficulties. Many experienced donors have commented favourably on the method from their point of view. The limit of 50 c.cm. per stone has a fair *margin of safety, but it should* be exceeded only in rare instances when the need for blood is very great and the donor is a relative of the patient. Never should it be exceeded when using the public-spirited, voluntary donors of the British Red Cross Society's transfusion service.

The simple apparatus used is shown in the illustraton.

The blood is collected in an ordinary quart milk bottle which has the advantages, as compared with special flasks, of being cheaper, stronger, and more easily replaced. The bottle is graduated in c.cm. for a few pence. The bung is of rubber. We use a Keynes's needle. All the rubber tubing is pressure tubing, for thin-walled tubing collapses under suction. The tubing between the bottle and the pump includes three sterile cotton-wool filters whose function is to prevent infection of the blood by the slight blow-back which occurs at the beginning of each stroke of the pump.

The donor should lie recumbent with one pillow. The operator, before scrubbing up, applies a sphygmomanometer cuff to the donor's arm, and blows it up to 70 mm. Hg. He also swabs the elbow flexure with spirit, and connects up the tubing to the pump, taking care to touch only the pump end of it. After he has scrubbed up, he dons a sterile gown and sterile gloves and isolates the area of the vein with sterile towels.



The apparatus used. The relative differences in projection of the glass tubes through the bung into the bottle are important and must be as shown.

The Keynes's needle is inserted into sterile 3·8 per cent. sodium citrate solution, two or three pumps given, and 100 c.cm. sucked into the bottle. A Spencer Wells forceps is then clipped on the tubing between the bottle and the glass connexion, and a good partial vacuum developed in the bottle by half a minute of vigorous pumping. Next, a wheal is raised over the vein by intradermal injection of a few drops of 1 per cent. novocain. The Keynes's needle is thrust through the wheal into the vein, and the Spencer Wells removed. Blood shoots through the glass connexion, and a moment later enters the bottle. If this does not happen, the vein has been missed or over-penetrated, and the needle must be manipulated, without withdrawal, till blood is seen in the glass connexion. Once the needle is in the vein, it is advisable gently to push it up the vein to its hilt so that a slight subsequent movement of the operator's hand may not cause the mishap of the needle slipping out of the vein.

The blood flows in a steady stream, and it is only necessary to give an occasional few pumps as collection proceeds. The donor should strongly clench and unclench his fist upon a roll of bandage about a dozen times a minute throughout the removal of the blood. If the flow stops for a moment, the needle should be given a slight twist to release the vein wall which has become sucked against the hole in the needle. The operator should control the needle with one hand, and hold the bottle with the other, so that it is below the level of the couch and out of sight of the donor. He should keep shaking the bottle to mix the blood and citrate solution.

When sufficient blood has been removed, the sphygmomanometer cuff is deflated, and the needle withdrawn. A swab is applied to the puncture, and the donor instructed to flex fully his elbow. The tubing on either side of the bung is disconnected. The top of the bottle is tied up in a sterile towel if the blood is not immediately wanted.

The closed nature of the method makes it more aseptic than the common practice of catching blood in an open jug; it also eliminates mess. The needle and tubing should be washed at once before clot forms. The donor should remain lying down for half an hour by the clock, and should drink two large cups of tea to replace the fluid lost.

GOLD SALTS IN THE TREATMENT OF ASTHMA

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THE use of gold preparations for asthma was first suggested in 1930 by Dudan,[1] who found that cases of asthma with radiological evidence of previous tuberculous lesions in the lungs were greatly benefited by intravenous injections of Sanocrysin. He reported disappearance of all symptoms and return to normal in some 70 per cent. of the patients treated in this way.

The beneficial effects of the remedy can be explained on grounds other than Dudan's theory that the asthma was due to a non-active form of tuberculosis. In all diseases successfully treated with gold salts (whether tuberculosis, arthritis, actinomycosis, or asthma), the first response is an increase of body-weight, with a very definite feeling of well-being, and improved sleep and appetite. This general tonic effect would partly be sufficient to account for the improvement in cases of asthma, but there are certain facts pointing to a specific tonic effect on the vegetative nervous system. This effect I am at present investigating, but the object of the present note is simply to record the results obtained in the treatment of 20 cases.

Preparations used.—The gold preparation used was Crisalbine, which was given intravenously at weekly intervals. Reactions were prevented by increasing the dose only when the previous strength had been well tolerated by the patient. The first was 5 mg. (0·005 g.) and the highest usually 0·05 g. (in two cases 0·09 g.). Altogether approximately 0·5–0·6 g. of gold was given, distributed over 20–25 injections.

Complications.—According to Anson[2] doses up to 0·1 g. hardly ever prove poisonous, and in nearly 80 per cent. of the cases treated by him all toxic phenomena occurred with doses above 0·45 g. This agrees with my own experience that the toxic effects of gold salts in this strength are negligible. Anson's figures apply to sanocrysin used in tuberculosis, but the advantage of small doses of gold applies even more to asthmatics, who are usually much less tolerant of intravenous injections than other patients. The urine was examined before each injection and I was never able to find any albumin in it. Slight dermatitis developed in 3 cases, but it disappeared within four weeks of discontinuation of the treatment, without administration of any of the drugs usually given, and the treatment could be continued.

Results.—Of the 20 cases treated with crisalbine 10 became wholly free from asthma, with return to normal condition, and remained free from symptoms more than a year after completion of treatment.

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[1] Dudan, A.: Schweiz. med. Woch., 1932, lxii., 96.
[2] Anson, C. E. H.: Tubercle, June, 1931, p. 385.

Of the other 10, 5 became free from asthma after the first course, but had a relapse after five or six months; 3 of them got well after a second course, though it is too soon to say whether the improvement has been permanent, but 2 did not respond to the second course. Out of the remaining 5 patients, 1 who had very severe asthma showed only partial improvement, 1 did not respond at all, and 3 had attacks of asthma as a result of each injection, so that the treatment had to be discontinued. In 8 cases out of the 20 great improvement was observed after the first injection (0·005 g. crisalbine); in other cases the improvement did not set in until after the third, sixth, or tenth injections. One patient developed asthma after 0·04 g. of crisalbine, another after 0·06 g., and another after 0·07 g. In these cases the attacks were only slight and subsided after a day or two.

My experience suggests that minute doses of gold salts are a harmless and valuable addition to the group of non-specific drugs (sulphur, iodine, tuberculin, &c.) in the treatment of asthma and deserve to rank first among such remedies.

London.

MEDICAL SOCIETIES

SOCIETY OF MEDICAL OFFICERS OF HEALTH

FEVER HOSPITAL MEDICAL SERVICES GROUP

A MEETING of this group was held on June 28th, Dr. H. S. BANKS, the president, being in the chair.

Dr. G. RONALDSON communicated observations on

The Pathogenesis of Diphtherial Paralysis

He said that the pathogenesis of diphtherial paralysis was a subject on which there was no consensus of opinion. Exponents of a central conception maintained that many points in the symptomatology admitted of no other explanation than an affection of the central nervous system, while supporters of the peripheral hypothesis were equally convinced that the paretic manifestations were the result of toxic action on the peripheral nerves. There were variants of both theories, but whether a central or peripheral view was favoured, the fact that analogous features existed between diphtheria and tetanus would be generally admitted. A brief reference to the pathology of tetanus was helpful in comprehending a view held by many leading French clinicians, viz., that diphtherial paralysis was of the nature of an ascending neuritis. In the ascending form of tetanus, the toxin was supposed to travel along the nerves from the infective focus to the central nervous system, and the first manifestations appeared in the immediate neighbourhood of the wound. The French theory of the pathogeny of diphtherial paralysis was essentially similar; it was initially an ascending nerve transport process with local symptoms of central origin. A theory which was more familiar to English readers was that of F. M. R. Walshe, who sought to adapt the Meyer and Ransom tetanus classification (local, specific, and general) to the nervous phenomena of diphtheria. The local form was exemplified by paresis of the palate in faucial cases, and this was alleged to be the result of toxin ascending from the fauces to the central nervous system by the perineural lymphatics. The specific form (oculomotor palsy) was central in origin and the generalised (polyneuritis) "sometimes central and sometimes peripheral," but the toxin in these latter types was said to be carried by the blood. Dr. Ronaldson then summarised the chief arguments in favour of nerve transport hypotheses in general. Certain recorded instances of accidental injection of diphtheria toxin had thrown some light on these questions and a number of these happenings were referred to as series A, series B, series C, and series D, which had occurred in certain foreign countries. The paretic sequelæ were almost identical with those of natural diphtheria—e.g., in series A, paresis of accommodation 3rd week; palatal paresis 3rd–4th week; peripheral neuritis 6th–9th week. As these were virtually examples of artificially produced paresis in the human subject and there could be no question of a coexisting faucial lesion, the occurrence of palatal paresis definitely refuted the argument previously mentioned. In the words of the observer of the series C cases, "extensive observations on several hundreds of cases have revealed to us paralysis of the palate and pharynx with the same frequency following injection into a point however far from the pharynx." In some cases an injection in the gluteal region had occasioned an acute neuritis with positive Lasègue's sign and paresis of the muscles supplied by the peroneal branch of the sciatic. This "local" condition was quite different from the paresis of natural diphtheria and its counterpart must be sought in the results of animal experiment where injections into the sciatic nerve had produced a comparable lesion. Dr. Ronaldson then described with comments the diphtheria toxin experiments of H. Meyer, Babboneix, and others. His conclusion was that the results of such experiments could not be dissociated from an inflammatory element which was absent in the naturally occurring disease, and the ascending process which was often referred to as characteristic had not been satisfactorily demonstrated. The work of Defrise, Jossifow, and other anatomists had disposed of the contention that the perineural lymphatics acted as pathways for toxin carriage; they had traced these lymphatics to the neighbouring lymph glands. The important tetanus researches of Abel and his associates had told us that when properly graded doses were employed, the length of the latent period was the same in large or small animals. The local sensory loss which was an occasional sequel of the Schick test had demonstrated the possibility of local action with a "time lost" factor entirely independent of any nerve travel. The nerve transport theory remained unproved and the arguments adduced in its support had no validity. The speaker then gave his reasons for asserting that a purely peripheral conception was not altogether in accordance with the known facts, though he contrasted the very constant evidence of peripheral nerve changes with the meagre and inconstant findings in the central nervous system. Extended histopathological investigations of the central nervous system in diphtheria should be carried out with the employment of modern technique; negative findings in a small series of cases did not prove the correctness of any conception. Such unusual symptoms as trismus, athetosis, convulsions, and transient hemiplegia were seen in the series B cases, and Dr. Ronaldson had published similar examples in cases of natural diphtheria. These rare phenomena were of no great clinical significance, but they showed the possibility of hæmatogenous involvement of the central nervous system, and their occurrence proved that the "blood-brain-barrier" was not absolutely impermeable to diphtheria toxin. The case for hæmatogenous central involvement was really dependent on clinical inferences and a number of suggestive clinical observations were mentioned. Various types of impairment of the palate were described. The only truly local form of diphtheritic paralysis was the precocious variety, and its pathological basis was probably a myositis which was the result of toxic saturation. What had been called the local sign or factor was quite different and the simple and most satisfactory explanation was a process of toxic diffusion. All confusion would be obviated if this type were referred to as "regional."

Dr. F. M. R. **Walshe** confined his remarks to his own clinical observations. During the war chance had given him the opportunity of seeing some 100 cases of diphtheritic paralysis following faucial diphtheria, and some 60 cases following extrafaucial diphtheria (cutaneous and wound infections.)

Of the faucial cases over 90 per cent. of those showing nervous manifestations had palatal paralysis as an early sign. Of the extrafaucial cases, none showed palatal palsy, but a third had an early palsy related anatomically to the seat of the infective focus. In addition to these there were two cases with infected cutaneous lesions in whom there had been palatal palsy in the absence of any history of sore-throat. But both of these had come under observation several weeks after the onset of their symptoms, and the absence of positive throat findings at this juncture did not exclude its probable early presence. Similarly, the absence of a history of sore-throat was not conclusive, because all were familiar with typical cases of post-diphtheritic paralysis in patients who gave no history of sore-throat. He had seen such cases himself. Therefore, it appeared to him that the only reasonable interpretation of these 160 observations was that the initial palsy in diphtheritic paralysis was of the nature of an ascending neural intoxication from the site of the infective focus. It was impossible to disregard the mass of evidence in favour of this view. The later developing multiple neuritis was probably a blood-borne intoxication and was manifestly the result of a peripheral lesion, whereas the initial local palsy was almost certainly central in origin. A study of the literature of extrafaucial diphtheria from the point of view of its nervous complications was disappointing, because the clinical descriptions were usually grossly inadequate, but even so the literature contained numerous case records which supported the view he had put forward, and—as far as natural diphtheria was concerned—no cogent evidence against it. In any case, any assessment of the nature of diphtheritic paralysis required as a background a working knowledge of other intoxications and diseases of the nervous system, and this was rarely forthcoming from those who wrote upon the subject.

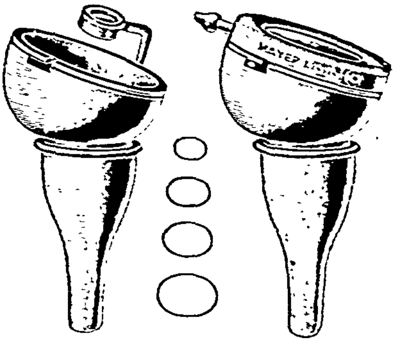
Dr. M. **Mitman** maintained that diphtheritic paralyses depended upon lesions of the central nervous system. He believed that the rapidity of onset and the extent of paralyses vary with the extent of the oropharyngeal membrane. The fixation of toxin to nervous tissue occurred early in the disease, and once fixed, antitoxin was incapable of affecting it. The latent period before the onset of paralyses was occupied by the time taken for transportation along nerves and affection of cranial nuclei. Those nuclei nearest the site of entry of toxin into the central nervous system were the earliest and most frequently and severely affected. The common sequence of paralyses—what he called "the march of paralyses"—depended upon the time taken for toxin to travel inside the central nervous system from one nucleus to another. Once the toxin was disseminated any nuclei might be affected, although the toxin appeared to exert some selective affinity. All the paralyses could be explained on this hypothesis. The so-called late cardiac failure he also attributed to a central (bulbar) involvement. In support of this view he drew analogies with other diseases of the central nervous system: tetanus, acute poliomyelitis, and lead palsy, and brought forward several clinical, pathological, and experimental arguments in its favour. He mentioned a case of severe diphtheria in which diaphragmatic paralysis was followed by paralysis of the upper intercostals and then of the lower. This suggested to him a progression of the process downwards in the cervical cord. He had seen unilateral paralysis of the palate, eye, or other structures appearing on the side of the original faucial membrane. He held that this was the rule and depended upon a nerve transportation of toxin to one side of the central nervous system. If the faucial affection was bilateral, the unilateral paralysis would appear on the side which had had the more extensive membrane. Sometimes paralysis occurred on one side before the similar structure on the other side was affected. The side of the earlier paralysis was the side of the more extensive membrane. If these findings were accurate they could only be explained by a central nervous lesion.

NEW INVENTIONS

A MODIFIED SIEGEL'S SPECULUM

The features of the speculum shown in the accompanying figure are:—

1. *An opening in the upper part to facilitate rarefaction of air inside the ear.*—The procedure is as follows. The speculum having been placed in the ear, the rubber bulb attached to the speculum is pressed with the right hand and completely emptied of air, the latter escaping through the opening. The opening is next closed with the index-finger of the left hand, the bulb is released and the air thus drawn from the ear into the bulb; during this process discharge is coaxed from the middle ear into the meatus. A very powerful suction is obtained in this way: "sticky discharge" of Eustachian or attic origin is easily drawn into the meatus. I found this speculum particularly useful when preparing the ear for ionisation. With Siegel's speculum I only succeeded in moving the discharge to and fro without being able to detach it from the compartments of the middle ear.



2. *A magnifying lens.*—A revolving magnifying lens is incorporated in this speculum. To bring it into action the top part is removed and the lens revolved into the line of vision: the lens enables the surgeon to remove impacted wax or polypi, or to cauterise granulations with great facility.

The speculum was made for me by Messrs. Mayer and Phelps, of New Cavendish-street, W.1.

London, W.　　**Arthur Miller**, F.R.C.S.

REVIEWS AND NOTICES OF BOOKS

Entstehung und Funktion von Gefässsystem und Blut auf Cellular-Physiologischer Grundlage

By Dr. Med. MAX HAUSMANN, St. Gallen. Basel: Benno Schwabe and Co. 1934. Pp. 704. Rm. 44.80.

THE genesis of the circulatory system and of the blood is here traced back to rudimentary beginnings in invertebrate forms. The problems involved are discussed at length from both morphological and physiological aspects. The work is divided into three main parts: in the first the author examines the morphology and histology of the cœlomic system in all the principal invertebrate types; in the second the development of the vascular system in primitive vertebrates is described, while the third gives a remarkably complete account of the physiological aspects of the circulatory system in the higher vertebrates.

It is difficult to give an adequate impression of so comprehensive a work: the canvas is vast and full of detail. Dr. Hausmann takes the view that the vascular endothelium of the vertebrates is derived phylogenetically from the cœlomic elements of more primitive forms. Following Lang's trophocœle theory he finds that the cœlom is productive of endotropic and exotropic formations. The latter leads to the appearance in the animal kingdom of the so-called hæmocœle and hæmocytes which evolve later into the vascular system and its various components. The blood-cells spring in part from the primitive mesenchymal cells and in part from the vessel wall itself by proliferation. It is interesting to find that the author regards the reticulo-endothelial system as essentially primitive. According to him the phagocytosis and storage of dyes is a feature of primitive cell forms, and is seen in the relatively undifferentiated mesenchyme of the humbler invertebrates. In higher forms the elaboration of different types of connective tissue has tended to suggest falsely that the reticulo-endothelial system is a specialised product. Numerous other sidelights are thrown upon current medical teaching: an instance may be given in the interesting analogy traced between the land vertebrate's hypophysis and the sub-neural gland of fishes. The latter is directly exposed to currents of sea water and acts as a sort of sense organ, regulating the animal's water metabolism. It may be more than a coincidence that the hypophysis of higher forms, and related structures in the floor of the third ventricle play an important part in the control of the water balance of the body.

The book will principally appeal to the zoologists and biologists as a noteworthy study in comparative morphology and physiology. But it will also attract those whose chief interests are elsewhere but who maintain a philosophical interest in the animal kingdom. The book is well produced and lavishly illustrated; it deserves a better binding.

Traité de gastroscopie

et de Pathologie Endoscopique de l'Estomac. By FRANÇOIS MOUTIER, Chef de Laboratoire de la Faculté de Médecine. Paris: Masson et Cie. 1935. Pp. 347. Fr. 120.

THE subject of gastroscopy was brought prominently to the notice of many members of our profession during the discussion at the Royal Society of Medicine this winter, when Prof. Arafa, of Egypt, gave a demonstration and lauded the value of this method. Those requiring complete technical details concerning the use of the gastroscope will therefore welcome this book by Dr. Moutier.

In his introduction to the work Prof. P. Duval writes: "Gastroscopy should now be one of the ordinary clinical methods of examining the stomach. It occupies a similar place to radiology; it is neither superior nor inferior in value to this, it is the indispensable complement." It is essentially in helping us to determine the presence of gastritis and to estimate its real importance that gastroscopy promises to be of value; this volume, which is abundantly illustrated with coloured plates, should prove extremely useful to those wishing to pay closer attention to the lining of the stomach. Whether the enthusiasm for gastroscopy of its author and of his medical and surgical colleagues at the Vaugirard Hospital in Paris is fully justified time alone will show. For the moment it suffices to say that this treatise is the most up-to-date work available on this subject.

A Brief Outline of Modern Treatment of Fractures

By H. WALDO SPIERS, A.B., M.D., Professor of Orthopædic and Fracture Surgery, College of Medical Evangelists, Los Angeles, California. London: Baillière, Tindall and Cox. 1935. Pp. 129. 9*s*.

THE aim of this small text-book is to subtract from the rather confusing welter of methods and apparatus described by various surgeons those that are of proven value; to introduce these to the student in a clear and simple manner, so as to avoid burdening his mind with unnecessary detail; and to leave in his mind a knowledge of the fundamental principles involved in treating fractures. To a large extent these aims have been realised; but the result has not been to produce a particularly elegant or pleasing text-book. Too much can be sacrificed to brevity, and it is doubtful whether the descriptions of treatment are sufficiently detailed to be of much value to the casualty officer or to the young practitioner in his first attempts at fracture treatment. As a text-book for the examinee who requires a rapid general survey of the subject, the book has more to recommend it. The outline drawings are definite and clear, but they are, on the whole, poorly drawn; moreover the style of presentation, notably the construction of paragraphs in a series of choppy sentences, calls for improvement. Little fault will be found with the particular methods recommended in individual fractures; those chosen are, on the whole, the most generally popular. The explanation, if such it can be termed, of the occurrence of "neurotic spine" is curious. It is said that it "probably goes back to the subconscious fear which in tribal days the individual had, due to the severe penalty which usually accompanied a disabling injury of the back. A member of the tribe whose back was disabled was known to be an economic liability in those days and in all probability his life was routinely sacrificed." An ingenious suggestion but hardly convincing.

THE LANCET

LONDON: SATURDAY, JULY 13, 1935

THE ADVERTISEMENT OF SECRET REMEDIES

THE exploitation of sick persons by preying upon their ignorance, their credulity, and their morbid hopes and fears is a social evil which no one can defend. It is a cruel fraud to offer secret remedies claiming to cure diseases like cancer or tuberculosis which, so far as is known, are incurable by drug therapy. As reported in another column, the Minister of Health gave a sympathetic answer last week to a request for legislation to control the advertisement of medicines and surgical appliances. He had been interviewed by a deputation representing not merely the medical and pharmaceutical professions but also the advertising business and the newspapers as well as local authorities and other bodies with wide interests. The deputation was able to tell the Minister that a draft Bill had been prepared with a degree of agreement never previously attained. Its limited objectives were twofold—first the prohibition of advertisements of medicines, appliances, or treatments claiming to cure or prevent certain scheduled diseases, and, secondly, the prohibition of invitations to the public to obtain diagnosis or treatment of those diseases by correspondence. The specified diseases are those which are either incurable or are obviously unsuitable for unskilled treatment, and those sexual ailments which notoriously give a sinister opportunity to the impostor and the blackmailer. The Minister agreed that legislation was needed, but he naturally added the inevitable reservations about the existing commitments of the Government's programme which must be expected from responsible members of the Cabinet. We would venture nevertheless to beg the Minister to remind his colleagues, whatever their political preoccupations, that the existence of this public scandal is no new discovery. It is now over twenty years since a Select Committee of the House of Commons was appointed to inquire into the sale of proprietary remedies. The resultant report (reprinted as a special supplement to THE LANCET of Jan. 10th, 1925) was as damning a document as could be. Even if the evidence whereon its conclusions were founded belongs to the pre-war period, those conclusions might equally be reached after inquiry to-day. While the Select Committee found that patent and proprietary medicines were in some cases genuine scientific preparations or unobjectionable specifics for simple ailments, it declared that many secret remedies made grossly exaggerated claims, caused injury by delaying recourse to proper medical treatment, contained large quantities of alcohol in disguise, were sold for improper purposes, and professed to cure diseases incurable by medication. Some were "essentially and deliberately fraudulent," marketed by swindlers who exploited for their own profit the apparently invincible credulity of the public. Well might the Select Committee describe all this as a grave and widespread public evil. New legislation, it observed, was urgently needed; the existing law was chaotic and had proved inoperative; prosecution for fraud was hampered by the greatest difficulties, and the sale and advertisement of secret remedies went on practically uncontrolled. Foreign countries and the Dominions oversea managed to protect their citizens; in Britain the law was powerless. And this indictment has been left on the file for over twenty years.

Since 1914 Parliament has enacted useful reforms in kindred matters. The traffic in dangerous drugs has been restricted; the standardisation of therapeutic substances has been secured, and the laws of pharmacy and poisons have (quite recently) been overhauled. But the Proprietary Medicines Bill, officially designed to give effect to the main recommendations of the Select Committee, though introduced in the House of Lords in 1920, was allowed to die quietly and still awaits its resurrection. When the Food and Drugs (Adulteration) Act of 1928 rewrote the familiar prohibitions on sales to the prejudice of the purchaser, the old exception in favour of patent and proprietary medicines was preserved. The Merchandise Marks Act penalises the sale of goods under a false trade description. In the main, however, the buyer is left to such redress as the common law affords him. Criminal proceedings for fraud break down for three simple reasons. First, in serious cases, as where drugs have been advertised to procure abortion, the police can hardly produce a witness to proclaim the illicit purpose of her purchase and her disappointment at its results. Secondly, the defendant often manages to call somebody who says the secret remedy has really done him good; thus a few dubious testimonials excuse a thousand other cases of sheer imposture. Thirdly, it is impossible to prove wilful misstatement and guilty knowledge where retailers are ignorant, as they usually are, of the composition of what they sell. A case at Liverpool in 1907 struck the Select Committee as typical. The label on a preparation (which was sold for 2*s.* 9*d.* though its materials cost about a penny) stated that it contained "the active ingredients and digestive qualities of the gastric juice in a highly concentrated and permanent form." The analyst's certificate showed water, traces of phosphoric acid, hydrochloric acid, nitric acid, and calcium phosphate, flavoured with chloroform and a vegetable bitter, and coloured with cochineal. The minute quantity of hydrochloric acid was the only conceivable part which resembled the gastric juice. The retailers, not the manufacturers, of the remedy were prosecuted by the Liverpool Corporation. As it was not possible to prove their guilty knowledge, the prosecution was withdrawn, the defendants being awarded five guineas costs. It need scarcely be added that the City of Liverpool was thus discouraged from any similar action in the future. The Select Committee mentioned one other instance of the comparative impotence of our law. It was informed that an American called MACAURA had netted £60,000 by a campaign in England of advertising, exhibiting, and selling an alleged vibratory cure for many ailments, whereas for the same procedure in Paris he was promptly sentenced to three years' imprisonment and a fine.

The financial success of secret remedies was part of the evidence which convinced the Select Committee that the evil was widespread. It noted that the owner of "Dr. Williams' Pink Pills for Pale People" left a fortune of over a million pounds. Companies which make and sell proprietary medicines have flourishing balance sheets. Their main expenditure is in advertisement, and in this imperfect human world this outlay gives them no small influence over the press. The Proprietary Articles section of the London Chamber of Commerce estimated in 1914 that two millions were spent annually in this country in advertising proprietary medicines. The Select Committee observed that this expenditure led newspapers, either from discretion or under compulsion, to exclude the criticism or discussion of secret remedies. When the British Medical Association sought to educate the public by issuing its volume on "Secret Remedies," most newspapers (according to the Committee's report) omitted to give it any editorial notice; many journals, even those of the highest class, declined an advertisement of the book. There are newspapers which exercise a vigilant censorship over the advertisements of secret remedies; there are others which do not. Even the medical papers, remarked the Committee, have not been scrupulously careful—just as, in another sphere where laxity is unfortunate, members of the medical profession have not always refrained from giving testimonials to dubious preparations. It would be foolish now to dissipate energy or to weaken the common purpose by scolding one another. What is wanted is a better law more vigorously administered. The Committee placed on record instances of exaggerated claims which all can condemn. Here are two taken at random. Vitadatio "will cure the most severe cases of cancerous growths, tuberculosis, consumption, heart trouble, and tumours"; the Government chemist found it to be apparently a decoction of bitter herbs containing only 1·48 per cent. of total solids and no alkaloids or resins. Antipon, "one of the most valuable discoveries in modern therapeutics, solving once and for all the vexed question of the radical cure of obesity without harmful after-effects," was found to be a solution of citric acid in water, without medical effect upon corpulency. This latter example may be paralleled from the last annual report of the Ministry of Health which mentioned certain "slimming tablets" as consisting of a mixture of aperient drugs likely to cause chronic purging. The salesmanship of the advertisers moves with the times. "Mother Seigel's Syrup," for instance, no longer bears the romantic statement that "an old woman, Mother Seigel, on her last legs with dyspepsia, was given up by her relatives and was allowed to wander in the lanes round her native village in Germany," where "one day she chewed a leaf of a herb, only found in those parts, and found immediate relief." The Select Committee opines that there was no such Mother Seigel and no such herb. The preparation, containing hydrochloric acid and borax, has been put forward as a cure for dyspepsia, liver complaints, and anæmia. It cannot be sold, unless smuggled, in Germany (where it is prohibited by name except on a doctor's prescription), France, Austria, or Italy. Britain alone enjoys this freedom. To fictitious names like "Mother Seigel" the Committee added evidence of other aids to success. It investigated an advertisement which read: "Fits—Clergyman offers prescription for 1*s.* 1*d.*—never fails." Application brought a prescription for "Koronium bromide" and a reference to the "actual manufacturers" in Cheshire. This was an invented name for strontium bromide, often prescribed for epilepsy, and purchasable, according to the Committee, at rates varying from 2*s.* to 3*s.* 8*d.* per pound. The Cheshire manufacturers sold it at 4*s.* 6*d.* for four ounces. The police found that the advertiser traded from a lock-up shop under the name of "Whitby and Co., chemists, opticians, and wine merchants." It will hardly be expected that the owners of secret remedies will place at the disposal of the public any new drug or new method of compounding known drugs. When the Committee looked into the less reputable concerns, it found proprietors whose commercial operations involved several aliases. Thus two Americans, VIRGIL P. NEALE and THOMAS ADKIN, were the Cartilage Company advertising a means of increasing height; as HARRIET META they sold a wrinkle eradicator; as KATHRYN B. FIRMIN, of the Roman Solvene Laboratory, they undertook to remove superfluous hair, and as EVERETT WOOD they offered to restore the hair to bald heads. Among other minor influences for misleading the public the Committee noted that the patent medicine stamp has been used as if it implied a Government guarantee. But the ridiculous anomalies of the Stamp Act deserve a chapter to themselves. Comic relief is rare in the statute book; no other country could produce such an example as the unrepealed schedule to 52 Geo. III. c. 150 with its list of drugs from "ADDISON's re-animating European balsam" to "ZIMMERMAN's stimulating fluid."

There is much to be said for the proposal that all remedies should exhibit their formula. An inventor has to disclose his secret to the Patent Office as a condition of protection. Why should the inventor of a medical preparation object to disclosure? The Select Committee, however, deprecated compulsory exhibition of formulæ except in the case of alcohol, poisons, and other dangerous drugs. A technical statement of constituent chemicals, it said, would convey little to the public. Disclosure would invite unfair competition and ruin the investments of existing shareholders. The Committee nevertheless recommended that the formulæ of all secret remedies should be compulsorily communicated in confidence to a competent official appointed under authority of a Government department. This proposal formed part of the Bill of 1920. There was to be official registration of all proprietary medicines and proprietary surgical appliances as a condition precedent to manufacture or sale. Though the draft Bill which was mentioned to the Minister of Health last week has not yet been published, it is understood that it does not go so far as the Bill of 1920. For the present we must concentrate on a reform of the law which is practicable; it is imprudent to imperil the measure of agreement already attained or to antagonise vested interests unnecessarily. The draft Bill will be welcomed by the proprietors alike of respectable newspapers and of respectable remedies. The attitude of the medical profession will not be in doubt, although, needless to say, the proposals are not put forward in the interests of surgeon or physician but in the public interest. If the public is allowed to know the evils of the present system, the public will demand the reform. Nor will it wish to wait another twenty years.

GOLD AS A REMEDY

THE history of the gold treatment of pulmonary tuberculosis is well known. KOCH's observation that potassium gold cyanide kills tubercle bacilli in vitro, though later shown to be irrelevant, is an impressive starting-point. FELDT's compounds, aurocantan and krysolgan, were produced about the war period and attracted less attention in this country than MØLLGAARD's sanocrysin in 1924. After the first wave of enthusiastic interest had passed, sanocrysin settled into a modest but significant rôle in the treatment of phthisis: clinical opinion, in this country at least, holds it capable of checking the destructive process in the lung in certain phases of the disease, but its effect is not predominant among the influences that determine the patient's course, and therefore, in series of cases such as the one reported by Dr. PETERS and Dr. SHORT in our last issue, its use may bring no amelioration of the death-rate.

Meanwhile other gold compounds have been made by the chemists and other fields of possible usefulness explored by the clinicians. Gold treatment of chronic arthritis began on the continent several years ago and is now attracting more notice here. Two months ago we published a report[1] from Liverpool that dealt with 100 cases of rheumatoid arthritis, osteo-arthritis, and "menopausal arthritis": every patient received one course (occasionally more) of gold injections, in addition to routine dietetic and physical treatment, and five years after the series began Dr. PEMBERTON was able to classify 50 of them as cured or very much improved, and a further 38 as improved. And last week, another group of 100 cases[2] was reported by Dr. HARTFALL and Dr. GARLAND from Leeds. Although observed only in the past two years, these cases provided in some ways a more striking result, for physiotherapy and analgesics were withheld and gold was in effect the sole treatment. The arthritis was always of the rheumatoid type, its average duration was several years, and more than half the patients had previously had various kinds of treatment without lasting benefit. Gold was given intravenously, in small to medium doses, but the injection courses were repeated, with intervals of at least six weeks, two or three times or more. HARTFALL and GARLAND claim cure or marked improvement in 70 per cent. of the cases, but rightly point out that the method is still in an experimental stage, and much may yet be learned about optimum dosage and other therapeutic details. Gold has also been tried in syphilis, leprosy, actinomycosis, and other chronic inflammatory and granulomatous conditions, as well as in dermatology; in Germany it has been warmly advocated for asthma, "especially in cases where modern psychological treatment is unavailing"[3]—a claim supported by Dr. SOBHY's letter in our issue of August 11th, 1934, and by Dr. BANSZKY in a note appearing on p. 79 of this issue.

Trial and error is the only method by which the value of gold as a remedy will be defined, and more trial is still necessary. The error, unfortunately, involves disasters as well as failures. Moderate reactions, in the form of fever, albuminuria, vomiting and diarrhœa, and erythematous skin rashes, are familiar to all who have used it. A severe exfoliative dermatitis occasionally occurs, and it is now being realised that fatal damage to the blood-forming organs can be caused by gold. The Leeds report already mentioned included two deaths from thrombocytopenic purpura, and a third non-fatal case is reported by Dr. HUDSON in our present issue. Almost nothing is known of the mechanism whereby gold acts, either beneficially or harmfully, and the harmful effects recorded seem to bear little relation to the preparation or the dose used. There is some evidence that severe purpuric reactions can be successfully combated by blood transfusion, and in Germany calcium administration is thought to protect to some extent against all toxic effects. Gold remains, however, a two-edged weapon, brandished in the dark. If, in such serious diseases as rheumatoid arthritis, it does good that nothing else will do, then a certain risk of harm can be justified. At the present stage in its history, it should clearly be used and investigated by experienced workers, who have groups of suitable cases under their control, and who are on their guard against its dangers; it is not a remedy for the therapeutic dilettante.

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[1] Pemberton, H. S.: THE LANCET, 1935, i., 1037.

[2] Hartfall, S. J., and Garland, H. G.: Ibid., July 6th, 1935, p. 8.

[3] Feldt, A.: Fortschr. d. Therap., 1935, xi., 11.

HOSPITALS LARGE AND SMALL

THERE are now in London 145 voluntary hospitals which keep their accounts according to a uniform pattern[1] and submit these annually for publication as a condition of the support of King Edward's Hospital Fund. This fund compiles and issues separately every year: (1) a statistical summary of the income, expenditure, work, and costs of these hospitals; and (2) a statistical review of the total figures. The summary for 1934, just issued,[2] costs only a shilling, and contains a mass of information so aptly grouped and attractively presented that even those with no direct concern in hospital administration will find in it material of interest. The annual budget of all the hospitals combined, covering nearly 15,000 occupied beds and 10 million out-patient attendances, was in 1934 not far short of four million pounds. Those who cling firmly to the voluntary principle of making provision for the sick poor will be gratified to learn that 91 hospitals had a surplus, and only 54 a deficit, of income over expenditure during the year and that there was a net surplus for all the hospitals in 1934 of £93,000, or 2·4 per cent. of the total general expenditure. Perhaps the two most interesting items about each hospital from a broad point of view are (*a*) the percentage of the average bed complement which is vacant and (*b*) the annual cost per occupied bed. It is satisfactory to be assured in the prefatory note that the lowest cost per occupied bed is not intended to be taken as a model. All comparisons are with the average and even so, high cost is not necessarily interpreted as implying excessive or extravagant expenditure. It may of course mean relatively inefficient administration; but it may also mean a higher standard of diagnosis or treatment, or of general comfort than that deemed adequate in the average hospital of the same size or kind. For example, in some of the hospitals the establishment and maintenance of a bigger staff of trained nurses or of domestic help to relieve nurses for more important duties, or the provision of additional comforts for patients, are cited as causes of increase in the cost per occupied bed, which can be fully justified; similarly among the smaller hospitals the enlightened boards of management who are prepared to bear the overhead charges associated with radiology and pathology departments offer diagnostic advantages to the patients which are clearly worth while. The variation in the cost per occupied bed is enormous—from £71 at a heart hospital for invalid children to £339·8 at a hospital for Anglican clergy and their families. The average for all hospitals is £174·7, and it is of interest that of the 16 groups into which the 145 hospitals are classified the only ones which show a total cost per occupied bed above this average are Group I, the 12 general hospitals with medical schools covering 6000 beds (£203·2) and Group XI, the 9 maternity hospitals covering 600 beds (£176·9), the average percentage of available beds which are vacant being in each group approximately 11. Of the 10 small hospitals in Group VII (general and cottage hospitals under 40 beds, without a resident medical officer) which are often regarded as being relatively expensive to run, the cost per occupied bed in 9 instances is under the average for all hospitals; the exception has had more than 10 of its 18 open beds (58·7 per cent.) vacant during the year, and it is therefore less surprising that its cost per occupied bed should be £264·6. The only hospital averaging a still larger percentage of vacant beds is one of the smaller maternity hospitals, at which 65·4 per cent. of the 50 beds were generally unoccupied.

The question immediately arises whether hospitals with so many vacant beds are really filling a need which justifies their existence and are thus worthy of support, or whether they are only deflecting money and philanthropic effort which might more profitably be used elsewhere. This is not a problem of only local interest. There must be many hospitals outside as well as within the London area to which it applies. Recently we were asked by a correspondent whether there is justification for keeping open a cottage hospital of 30 beds in a district which could be served by another much larger and better equipped hospital. The annual income of the cottage hospital in question is £4000 and its expenditure £5000, and the struggle to keep it alive is arduous. Is it worth it? The question can certainly not be decided in the abstract, without a study of the conditions and needs and population of the district. The smaller general hospitals and cottage hospitals are often centres of local interest and local patriotism. It is a joy to many in the neighbourhood to work in and for these institutions and to contribute to their upkeep. In some places where a local hospital is successfully conducted it becomes almost a social centre. From the patients' point of view, moreover, it is always regarded as preferable to go to hospitals where they know the doctors in attendance, and where they can be easily visited by their relations and friends. The fact that the standard of work may be less high than in larger centres with many special departments is not appreciated by them. Local hospitals are, of course, of undoubted advantage to the general practitioners of the district, because the doctor is able to follow his patient into hospital and perhaps to continue in charge of his patient, or at any rate to discuss the case personally with the consultant, a discussion which may have high educative value. From a financial point of view, again, experience has shown that the closure of one hospital and the enlargement of another to take its beds is to reduce the combined income. There is, however, a real requirement for tabulation and analysis of the hospital facilities all over the country in terms of the needs of the population in the area. Such a survey was made for London in 1933, when the London Voluntary Hospitals Committee, in conjunction with the central public health committee of the L.C.C., carried out an exhaustive survey of the hospital accommodation available for those who live in the county.[3] The information collected was set out in detailed tables showing the number of beds in each hospital within the area and the use to which these beds are put; these tables included a statement of both in-patient and out-patient work at the several hospitals. The geographical relation of the hospitals to one another was graphically shown on two large-scale maps which were reprinted in reduced form and circulated with the report. A corresponding survey of hospital accommodation throughout the country would show the geographical relation of the smaller general and special hospitals to the larger and more centrally placed ones, and also the relation of the various hospitals to the density of population. The information thus provided would show up areas where increased accommodation is likely to be needed, or it might supply at a glance good reason why a certain hospital has an undue proportion of its beds unoccupied. Such a survey should include reports from authorised visitors of work done in the hospitals situated in each area and a statistical summary corresponding to the one for London to which we have referred above. If information were published on these lines, those hospitals which clearly fall below the average level in efficiency of administration and work done would have a great incentive to improvement. It is by no means clear that a survey would reveal that even quite small hospitals could be spared or that the present tendency towards centralisation in hospital affairs is likely to increase. Centralisation has many drawbacks, and the increasing speed and ease of making daily contact with scattered units may well produce a reaction in their favour.

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[1] The Revised Uniform System of Hospital Accounts. London: George Barber and Sons. 1926. 5s.

[2] Obtainable from King Edward's Hospital Fund for London, 10, Old Jewry, London, E.C.2. Pp. 100. 1s.

If the local authorities and voluntary hospitals could be persuaded to collaborate in a joint national survey of this kind there is one respect in which they might with advantage depart from the pattern of the summary issued by King Edward's Hospital Fund. There the statistical cost of an out-patients' department is based on its cost per 1000 attendances. It is clear that this method of reckoning costs is a direct encouragement to hospitals wishing to demonstrate efficient and economical administration to maintain or increase the number of their attendances. It is now generally admitted that a large proportion of the attendances represent work which could properly be done by general practitioners[4]; but hospital authorities are hardly likely to give ungrudging help in thinning their lists while the costs of their out-patient departments are reckoned and compared on the present basis.

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[3] Summarised in THE LANCET, 1934, i., 323.

[4] See THE LANCET, 1935, i., 1521.

ANNOTATIONS

SUICIDE

SUICIDE is so important a problem that its study from every angle should be encouraged. It is, however, desirable that the methods used in its investigation should be such as may throw further light on its causes and its prevention. To use clinical material in such a way as only to confirm what psychiatrists and sociologists already know of suicide is not to make the best use of it. These reflections are prompted by the study[1] published by Miss Stoneman, Ph.D., a psychologist who investigated the cases of attempted suicide admitted to a certain ward in the Royal Infirmary, Edinburgh, during the years 1932–1933. This work is a good example of the kind of painstaking inquiry that fails through unsuitable choice of material and method. The author's procedure was in the main the psychiatric one of inquiry into the history of each patient and into the background of the immediate situation. Motives were discussed with the patient at length, psychological tests were given, and in themselves the case-studies are as complete as possible. From these studies, however, Dr. Stoneman draws some statistically unacceptable conclusions, to which she appends a new psychological theory to account for attempted suicide.

Suicide is, in fact, here investigated as a problem in itself. But suicide is only a problem in itself if one eliminates all that persons who attempt it have in common with those who do not. Many depressive patients, for example, never attempt suicide; it would be useless to look in them for the causes of suicide though one might well look for the causes of depression. But if one who examined depressive suicides might discover only the causes of their depression, he would not have advanced his knowledge of the causes of suicide in depressive persons. The same may be said of the many other people who attempt suicide; to investigate them without control material may throw light on many things but miss the essential point under consideration. Dr. Stoneman's notes of 87 patients reveal, for example, that distress, whether occasioned from without or from within, is the commonest state before suicide. She finds in these cases adverse social forces, adverse individual endowment, drunkenness, disease, thwarted desires, and the other causes of unhappiness or of an unbalanced attitude towards life and death. But this adds nothing to our knowledge. It is true that hardly any people commit suicide when they are happy, and that the causes of unhappiness are in some measure the causes of suicide. But suicide cannot effectively be studied without regard to the different kinds of disturbance of mind and adaptation in which it occurs. There may be little in common as regards causation and prevention between the hysteric who dramatically takes poison, the hapless lovers who decide to die together, the melancholic who cuts his throat, the fanatic, the martyr, and others of the great army of suicides. Nor can unsuccessful suicides be taken as representatives of suicides in general. Among them may be many who have not made a genuine attempt to kill themselves at all. Conclusions drawn from them may show why apparent suicidal attempts fail or what determines the choice of an ineffectual method, but not necessarily much about the cause of the attempt; in studying these cases one is after all studying "suicide" that is not suicide in act, whatever one may suppose it to have been in intention. If suicide is to be investigated as a single specific problem, somewhat rigid statistical methods are required, because there are so many variables. Such studies as those of Donalies in Berlin, and Lendrum in Detroit upon unsuccessful suicide, and the wide surveys of Dublin and Bunzel, Loewenberg and many others show what constant findings a careful statistical treatment yields.

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[1] Halfway to the Hereafter. An Enquiry into the Motivation of Attempted Suicide. By Ethel Turner Stoneman, B.A., A.M., Ph.D. Perth, Western Australia: T. F. Christie. 1935. Pp. 96.

Studies of suicide as a particular aspect of depression or some other psychiatric syndrome, or as an expression of fear or hate or death-instinct, according to this or that psychological theory have of course their place, though often they are either too general or too conjectural. The psychological approach must leave unanswered many social and biological problems that are of the first consequence in prophylaxis, and it is possible that at this stage sociological inquiries are likely to be more fruitful than are further psychiatric ones. We know that such things as economic hardship or the "featuring" of suicides in the press contribute to a rise in the suicide rate; but we can do little as yet to influence these. We know that competent psychiatric diagnosis and treatment can often avert suicide, but we cannot always prevail against public prejudice in regard to such treatment, especially if it is to be in an institution; and at the moment concentration on propaganda for mental hygiene and improvement of social condition is needed more than inquiry into the individual miseries which precede the decision to end life.

ERRORS DUE TO ANTICOAGULANTS

THE possibility that the anticoagulants in general use may cause errors in blood analyses has been suspected for some time. I. Blitstein[1] has now made a careful study of the variations which may be produced in this way. He has investigated the influence of potassium oxalate, sodium citrate, sodium fluoride, zinc sulphate, heparin, hirudin, and a proprietary anticoagulant called Liquoïde (sodium polyanethylsulphonate) on the following estimations: inorganic phosphorus, plasma proteins, chlorides, cholesterol, dry extract, and hæmatocrit. There are, he finds, two sources of error. First, the plasma becomes more dilute owing to water leaving the erythrocytes; this is dependent upon the increase in ionic concentration of the plasma due to the added anticoagulant. This effect is constant for the first four substances investigated and is in proportion to the quantity of the substance used. The second effect is more marked with fluoride and oxalate than with citrate and sulphate, and is due to the toxic action which these salts exert upon the envelope of the erythrocyte, whereby it loses the properties of a semi-permeable membrane and allows some of its contents to diffuse out into the plasma. The author concludes that these four anticoagulants should be discarded and that hirudin, heparin, or liquoïde be employed in estimations of hæmatocrit, dry extract, chlorides, and cholesterol. In determination of inorganic phosphorus, he holds, liquoïde only should be used as heparin contains traces of phosphorus and hirudin disturbs the colorimetric comparison. For plasma proteins, he believes that fibrinogen should be estimated by the refractometric method of W. Starlinger[2] and albumin and globulin from the serum. The interest in this paper lies in the conclusion that the anticoagulants in common use are those most apt to produce errors in estimations. Perhaps the point of greatest practical significance is that the hæmatocrit varies over a wide range with the four interdicted substances but is constant with the three others. The two blood analyses most helpful to clinicians—blood-sugar and blood-urea—have not been considered in this study.

THE ROYAL SURGICAL AID SOCIETY

THE annual report of the Royal Surgical Aid Society for this year has just appeared and the record of the work done shows that the society is living up to the high standard of practical utility which it has manifested since its start. And that is a considerable period, for it was established in 1862 at a time when no institution existed through which the needy patient could obtain much choice of the required surgical appliances. Many institutions did, and still do, largely assist discharged patients to obtain orthopædic appliances, this being particularly the case when an instrument of a certain sort was needed to maintain the improvement manifested and lead to further progress. But three-quarters of a century ago it was seen that such assistance was only applicable to the fringe of the manifest needs, and to-day, with the enormous growth of these needs, the value of the central organisation is more than ever obvious. The records in the annual report demonstrate how extensive and various are the wants of the applicants, and over 29,000 cases have had those wants supplied during the year under review. The charitable public has responded well throughout the history of the society, enabling it to continue its mission, but the committee appeal for more liberal support during the coming year, since there has been a slight falling off of income which does not accord with a certain abatement of general financial stringency. But while there has been a decrease in special donations in aid of cases, the payments received from patients themselves show a gratifying increase, while the cost of administration has remained almost stationary.

Accompanying the report there is an appeal for the constitution of a special fund to be devoted to the relief of cases in the Durham district. The demands from the distressed areas, Durham being taken as a centre, have increased to such an extent that the committee of the society do not feel justified in meeting them from the ordinary resources. There are, it seems, practically no subscribers to the society in the Durham district, and conditions being as they are it is obvious that assistance will have to be found from outside. Therefore the society is making a special appeal for the raising of a fund of at least £3000 in order to cope with this urgent situation, pointing out that if funds are forthcoming, enabling them to deal with the cases locally, a more direct control of the assistance will be created and trouble and postage saved on many fruitless applications by letter. Support in aid of this special appeal should be sent to the Royal Surgical Aid Society, Salisbury-square, London, E.C.

SYPHILUS AND SYPHILIS

IT is given to few men to achieve immortality by the expedient of inventing a single word. Such an unwonted survival has fallen to the lot of the poet-physician Fracastor, and in a fashion all the more curious because the fateful word occurs only in a somewhat uneasy addition to his poem as first written and finally taken as a part title for the extended work—*Syphilis sive Morbus Gallicus*. In this appended Book III, Fracastor relates how a certain shepherd, Syphilus by name, provoked Apollo by his impiety and as punishment was smitten by a new disease which from this the name of its first victim his fellow countrymen called "syphilis." In a recent issue of

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[1] Rev. Belge des Sci. med., 1935, vii., 69.

[2] Biochem. Zeitschr., 1923, cxliii., 179.

Fracastor's poem[1] his elegant Latin hexameters are printed on one page, and on the opposing page an English translation. Although this follows the Latin text closely, there is nothing in the easy and polished English prose to indicate that it reproduces accurately an original in another tongue. Mr. Wynne-Finch wisely gives his explanatory matter in a series of scholarly and delightful appendices, and limits his footnotes to the minimum necessary to explain the text. Mr. J. Johnston Abraham's erudite but most interesting preface tells of Fracastor's life and work, explains the range and purport of this famous poem, and recounts the circumstances of the great epidemic of the Morbus Gallicus. He declares his adherence to the theory of the importation of syphilis from America, brushing aside with a somewhat peremptory gesture the arguments against this theory. The collaborators have done their work so well that the result should attract a circle of readers of very diverse tastes. The classical and historical matter will, of course, have a wide appeal, but even the reader who had at the best but small Latin, and that long since worn threadbare, will not find his interest flag.

THE GROWTH OF KING'S COLLEGE AND HOSPITAL

WHEN John Curnow died in the year 1902 he had written and published, in the annual *King's College Hospital Reports*, a history of the college and hospital to the year 1880. In his obituary notice in the Reports doubt was expressed that a successor would be found with knowledge sufficiently deep to carry the history further. Fortunately however such a one has emerged in Willoughby Lyle, who has not only carried the unfinished task to 1934 but has rewritten and amplified the account of the early years.[2] Having been dean of the medical school for over 20 years, at a critical period in the hospital's existence, Lyle was well equipped for the task; but without his zeal, energy, and love for his school we should not have had such an interesting record of its 103 years' existence, or such a vivid and truthful description of its teachers and students. Not to King's men alone will this history appeal. Amongst the facts and events are many of wide and general interest.

The work begins with an account of the foundation of King's College and the medical department (1831–39) and there follows a description of the period of the first King's College Hospital (1839–61). This was the renovated workhouse of St. Clement Danes, in Portugal-street. The second King's College Hospital was built on an extended site of the first. It was opened in 1861, cost about £100,000 and had accommodation for upwards of 200 beds. The record of this second King's College Hospital is divided into the period before the advent of Lister (1861–77), the Listerian period (1877–1893), and the period subsequent thereto (1893–1913). The third King's College Hospital was opened at Denmark Hill on July 26th, 1913, by the King. It was designed when finished for 600 beds, and was admittedly, at the time, the last word in hospital construction. Within a year of the admission of patients the war broke out, and a large part of the new building became the Fourth London General Hospital (R.A.M.C.T.). After the war reorganisation became imperative; several new departments were created, promotions and new appointments were made, and the foundation was laid for the present excellent system of teaching. In the course of each section Lyle gives a chronological account of all important events, and a "medical history" of the representative King's men of the period. These personal records contain many interesting anecdotes. A short section deals with the interchange of teachers between King's and other metropolitan medical schools. An account is given of the establishment and progress of the Clubs and Societies Union. Though several inter-hospital athletic cups have been won, King's has never obtained the inter-hospitals rugby football or hockey cups. As an indication of the standard of medical work it is pointed out that the students have gained 108 gold medals at the university of London in the past 100 years. Tribute is paid to the second Viscount Hambleden, as a "public-spirited unselfish gentleman" who has been the hospital's greatest benefactor. This account of "King's" furnishes a valuable record of its development from being the mere department of a College (1830–1909) to the independent position of one of the constituent medical schools of the university of London.

FOOD POISONING

INVESTIGATING an outbreak of food poisoning is as fascinating and difficult a task as investigating a crime. In both the time factor is all-important; statements must be taken and clues examined before the passage of time blurs or destroys them. In both the coöperation of a number of experts and of the general public is necessary for success, and in both there is a central authority—the Ministry of Health or Scotland Yard—ready and eager to assist. Finally in both situations the investigation must proceed according to an orderly plan of campaign, and for food poisoning the Ministry have recently issued[1] what may be called a strategical plan, with notes on tactics, which every medical officer of health would do well to keep by him and use as a basis for any investigations he may have to make. The memorandum is a revised version of one issued in 1921, with an additional appendix giving technical hints on the identification of the salmonella types, the latter following the lines of the suggestions in the annual report of the chief medical officer of the Ministry of Health for 1933. It is to be noted that the specific duty is laid on the medical officer of health to report any serious outbreak of disease to the Ministry and also to furnish a copy of any special report which he may make to his authority, but otherwise he is free to carry out the inquiry on his own lines to and make use of local facilities for the bacteriological examinations if he so wishes. In outbreaks of food poisoning which are not of bacterial origin, the specimens will usually be sent to the public analyst appointed by the local authority; but in bacterial cases the chemical determination of the presence of "ptomaines"—in the sense of alkaloidal substances produced by bacterial action in meat foods—is held to be of no value. The memorandum also contains practical instructions for the collection, packing, and transmission of material, and suggests that the bacteriologist should always be consulted as to which specimens will be most instructive.

The incidence of food poisoning is by no means negligible. Every year some 40 to 70 outbreaks are reported to the Ministry of Health and in 1933 there were 66 outbreaks so reported with 15 deaths in the salmonella group alone. Often the article of food cannot be proved guilty; the police (so to speak) suspect the criminal, but evidence is insufficient to bring home the crime. But in every case the authorities depend in the first place on the willing coöperation of the practitioner to bring his suspicions to the notice of the medical officer of health and to ensure that specimens are preserved pending his investigation.

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[1] Fracastor: Syphilis or the French Disease. A Poem in Latin Hexameters by Girolamo Fracastoro. With a Translation, Notes, and Appendix by Heneage Wynne-Finch, M.A. Oxon., and an introduction by James Johnston Abraham, C.B.E., D.S.O., M.A., M.D. Dubl., F.R.C.S. London: William Heinemann (Medical Books) Ltd. 1935. Pp. 253. 10s. 6*d*.

[2] King's and some King's Men (London). By H. Willoughby Lyle, M.D., F.R.C.S. Oxford University Press. 1935. Pp. 615. 25s.

[1] Food Poisoning. Steps to be taken by Medical Officers of Health (outside London) in suspected food poisoning cases. Memo. 188 Med.

FOOD ALLERGY AND DIGESTIBILITY

STRICTLY speaking, the term "food allergy" implies the entrance into the blood stream of an unchanged food protein absorbed from the intestine and escaping destruction in the liver. Such an occurrence, as Alvarez[1] points out, is more likely to bring about disturbances away from the intestinal tract (e.g. urticaria) than local digestive symptoms like colic, nausea, or diarrhœa. In actual practice, however, supposedly allergic disorders such as migraine, angioneurotic œdema, and urticaria are not very often traceable to food sensitisation; thus in Alvarez's cases of severe urticaria, seen at the Mayo Clinic, it seldom proved possible for him or for the patient to pin the blame on any food. Another difficulty is the fact that supersensitiveness to some foods is apparently intermittent, varying with exercise, climate, and especially with fatigue and nervous strain. Finally, one has to reckon with an immense variety of possible noxæ; and it is no advantage, from the patient's standpoint, that the commonest foods such as bread, milk, and eggs seem also to be the commonest offenders—not the more easily delectable delicacies such as strawberries, caviare, or paté de foie gras. Alvarez and Hinshaw make the interesting suggestion that much of the digestive trouble caused by foods is due purely to irritation of the intestinal mucous membrane by the chemicals or cellulose they contain. On this view the "digestibility" of a food depends not upon its protein sensitisation action but upon some direct local effect, in the alimentary tract, of other substances besides proteins. Among 500 patients suffering (for the most part) from indigestion, Alvarez found that 7 per cent. were unable to drink milk because of severe distress; and 3 per cent. could not eat eggs, while many suffered after eating onions, apples, and cabbage. Chocolate, radishes, tomatoes, cucumbers, beef, coffee, lettuce, and many other foods were noted by patients as causative of indigestion. Such lists could of course be readily paralleled by many physicians, but extreme care is always necessary in drawing conclusions from patients' own deductions about their digestive capacities. Unfortunately Alvarez and Hinshaw's questionnaire gives no indication of the manner in which these various foods may cause their distressing effects, but their paper serves the valuable purpose of emphasising the importance of factors other than protein sensitisation in producing food indigestion. In our issue of June 29th Dr. W. C. D. Maile and Dr. K. J. L. Scott draw attention to the well-known effect of water taken with food in increasing the absorption of such a substance as sugar from the stomach, and to the fact that boiled milk is somewhat more rapidly emptied from the stomach than unboiled; and if such a relatively simple process as gastric emptying-time may be regarded as any indication of digestibility of foods it is evident that very small changes in the composition of a meal may produce quite obvious changes in "digestion." At the same time, minor psychic disturbances have so great an effect on gastric secretion and motility that all such observations have to be treated with reserve.

THE IRISH MEDICAL ASSOCIATION

AT its annual general meeting last week the Irish Medical Association gave approval unanimously to the proposal to amalgamate with the branches of the British Medical Association situated in the Irish Free State. For the last year and a half negotiations have been taking place between the representatives of the two associations and a draft agreement has been arrived at. This provides for the establishment of an autonomous Irish Free State Medical Union, consisting in the first instance of the members of the two existing associations who are resident in the jurisdiction of the Irish Free State. Members of the Union who leave the Irish Free State to reside in Great Britain will automatically become members of the British Medical Association, and members of the latter who go to reside in the Irish Free State will become members of the Union. From the point of view of the British Medical Association the Union will be regarded as a group of branches and will be represented by one member on the council of the Association. The Union will, however, be, as regards its work at home, completely autonomous, and will be responsible for its own government and by-laws. The members of the Union visiting London will be privileged to enjoy the amenities of the British Medical Association hours to use its library.

The Irish Medical Association has shown wisdom in deciding as it has. With a history of ninety-six years of useful work for the public and the profession to its credit a decision to merge its individuality in a newly formed organisation could not be undertaken lightly. It was clear, however, that the maintenance of two professional organisations in Ireland, engaged in almost identical work, was wasteful and cumbrous. Moreover, although there was cordial coöperation between the two bodies, neither could claim the prestige, influence, or authority that goes of right to a single representative organisation. It is designed that the amalgamation of the two associations should lead to members of the profession who have hitherto been unattached now giving their adherence to the Union. There are between two and three thousand medical men practising in the Irish Free State, of whom probably about one-third are members of one or both of the existing organisations.

LIVERPOOL VOLUNTARY HOSPITALS.—The report of the Commission which recently investigated the position of the voluntary hospitals of Liverpool has led to the establishment of a Liverpool Voluntary Hospitals Board, which has now had its first meeting. The eleven members include Prof. Henry Cohen, F.R.C.P., Mr. C. A. Wells, F.R.C.S., Mr. J. Bagot Oldham, F.R.C.S., and Prof. R. E. Kelly, F.R.C.S. The board is to investigate the proposals of the Commission and advise the nine teaching hospitals of Liverpool on their problems; it is also authorised to negotiate with the municipal authorities. The Commission took the view that the governing bodies of the four general hospitals must be amalgamated.

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[1] Alvarez, W. C., and Hinshaw, H. C.: Jour. Amer. Med. Assoc., June 8th, 1935, p. 2053.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LX.—PROGNOSIS IN ACUTE EMPYEMA

THE considerations which influence the prognosis in acute empyema are numerous, as might be expected in a disease presenting so many different types; the causative organism, the age of the patient, the nature of the pus, and position and extent of involvement of the pleura are all important. Again, empyema is peculiarly liable to complications, both local and in other parts of the body, and delay in diagnosis, which is often obscure, and the particular methods of treatment employed have considerable influence. Recovery is often so complete that no permanent effects follow, and naturally this is more likely in the less extensive and more rapidly cured cases. A large proportion, however, must be expected to have lasting effects of greater or less severity, such as flattening or lack of development of the affected side of the chest, scoliosis, pleural adhesions, and thickened pleura.

Empyema may cause death by compression of the heart and lungs, pulmonary or cerebral embolus, pericarditis, peritonitis, cerebral abscess, septicæmia, pyæmic infections of bones or joints, toxic exhaustion, or rupture into a bronchus.

Causative organism.—The streptococcus is responsible for the most dangerous cases, and infection of the pleura by this organism may follow pneumonia or broncho-pneumonia, particularly of the type complicating influenza, or may be part of a blood-stream infection from tonsillitis, osteomyelitis, or the like. A specially fatal form is met with after measles or broncho-pneumonia following measles, and such cases rarely recover. Pneumococcal empyema, on the other hand, is far less serious, whether it follows pneumonia or is a primary infection; the patients are not as a rule very toxæmic, and any severity of symptoms is largely due to the mechanical effects of an exceptionally large collection of pus. Owing to the thick consistency of the pus and the large lymph deposits drainage is necessary, and the chief danger of this form of empyema is avoided if secondary streptococcal infection is prevented.

Age.—In infants under two years acute *streptococcal* empyema is a fairly common complication of broncho-pneumonia and has a high mortality, however carefully the case is dealt with. *Pneumococcal* empyema is, of course, very often met with in children. In the first three months or so of life the disease has a high death-rate; after this age, even in babies of less than a year, the results have been much improved by valvular methods of drainage and the exclusion of secondary infection; in these days the mortality from pneumococcal empyema should be under 5 per cent. This is a great advance on the time when open drainage was practised and caused collapse of the lung and a sucking wound of the pleura, so frequently to become infected with streptococci after a few days as the result of inspiratory aspiration while the dressings were being changed.

Adults are better able even in such conditions to resist the secondary infection; in a large proportion of adults the empyema is localised, so that even open drainage is not followed by bad results. In old age, however, the prognosis is disproportionately bad, for old people put up a poor fight against infections wherever they occur, and empyema is not uncommonly the result of a lung abscess or gangrene, conditions in themselves very dangerous and usually implying a mixed infection from the beginning.

Type of operation.—An operation which provides "closed" or valvular drainage has considerably modified the outlook, especially in pure pneumococcal cases, for it allows the escape of pus while at the same time preventing regurgitation and secondary contamination through the wound; also the lung is encouraged to expand early and become adherent to the chest wall so that the empyema is soon localised to the region immediately about the tube. Such valvular operations even give a higher rate of recovery in streptococcal and putrid types, though in these infection of the chest wall, often spreading cellulitis or erysipelas, is commonly met with and cannot certainly be prevented.

The closed methods, involving a small intercostal incision and the use of a catheter or other small valvular tube, I do not regard very favourably, particularly because of the liability to interruption of the drainage by plugs of lymph. The operation that I have for many years found the most satisfactory is to resect three inches of rib and sew in a thick-walled rubber tube with a diameter the width of the rib resected; skin and muscles are sutured around this tube with drainage of these planes in all but pure pneumococcal cases; the tube is prolonged distally by collapsible Paul's tubing which closes during inspiration and allows exit only of the discharge. The best drainage and most rapid healing are obtained by resection of the eighth rib some two inches in front of the inferior angle of the scapula; this region is also the most suitable for aspiration of generalised empyema. Where drainage has been established here, healing usually follows rapidly after removal of the tube on the tenth day. Necrosis of the cut ends of the rib is a very rare occurrence, though it is often suggested as the cause of delay in healing; a far more common cause of persistent discharge is the formation of a bridge of bone between the cut ends, so that the track is partially or completely surrounded by a bony ring which impedes drainage.

ASPIRATIONS—DRAINAGE

In suitable cases repeated *aspirations* have done much to diminish mortality, especially in streptococcal and post-influenzal cases, in "putrid" empyema or where the infection is from the beginning a mixed one, and in pyopneumothorax. During active pneumonia operation should not be performed, but the case should be tided over by aspiration. If the general condition does not deteriorate aspiration may be repeated daily until the empyema has become at any rate partially localised or the discharge has become thick; but when in spite of aspiration the temperature rises to a high level at night and toxæmia is severe, especially with a steadily rising pulse-rate, valvular drainage must not be delayed.

As a general rule, collections of thin pus may be aspirated and drainage is indicated when the pus is milky. When on repeated aspirations the fluid rapidly reaccumulates in large amount, and instead of gradually changing to thick pus it remains thin, the prognosis is bad and failure of eventual recovery is to be feared.

In nearly all cases *drainage* is in the last stage necessary to finish off the remaining localised abscess and minimise pleural adhesion. A small empyema may become cured spontaneously by inspissation of its contents or by evacuation through a bronchial fistula; even large ones have in exceptional cases undergone spontaneous cure by becoming encapsulated by fibrous tissue or by rupturing through the chest wall or into a bronchus; but for practical purposes such phenomena are unimportant, for nearly all cases will die unless surgical treatment is adopted. In pneumococcal empyema, even though generalised, early drainage seems to give the best results, but one aspiration on the day before operation temporarily improves the patient's condition and lessens the severity of the operation.

DOUBLE EMPYEMA—THE ANÆSTHETIC

Double empyema is naturally more serious than single, and has a correspondingly high mortality; fortunately the condition is not often met with. Drainage of both sides at the same time should never be done. Successful results have been obtained by establishing valvular drainage on one side and daily aspirating the other until the empyema operated upon has become localised; the second side has then been submitted to valvular drainage about four days after the first operation.

The *anæsthetic* is important, and in adults the outlook is improved by avoiding the use of a general anæsthetic. It is a simple matter to infiltrate the skin and muscles with novocain and block three intercostal nerves near the angles of the ribs; such local analgesia is especially indicated for old people. In young children and certain other cases a general anæsthetic must be used and open ether is usually the most suitable. The patient should be placed in position for operation before the induction is commenced. Ether is well tolerated, even in the presence of bronchitis, and appears to be less irritating to bronchi and lungs than is chloroform; gas and gas-oxygen are unsuitable for cyanosed patients and are contra-indicated for empyema operations.

During operation on a generalised empyema the danger of sudden death from displacement of the heart and mediastinum is a real one; it is diminished by preliminary aspiration, and in other cases must be guarded against by keeping the pleural wound closed as much as possible by fingers and swabs to prevent sucking in of air.

LOCALISED EMPYEMA

Localised empyema occurs in four typical situations —i.e., (1) in contact with the lateral chest wall between it and the lung; (2) lower down between the lateral chest wall and the diaphragm; (3) posteriorly in the angle formed by the vertebral bodies and the posterior ends of the ribs; and (4) between the lobes of a lung. 1. The first type gives the best prognosis, for it can be drained at its centre so that the lung speedily expands to diminish the cavity, and final healing should be rapid. 2. In the low lateral type by the partial collapse of the lung and rise of the diaphragm the drainage track tends to become oblique and narrowed, so that a bottle-necked cavity is formed; this is one of the commonest causes of persistent sinus and calls for resection of a portion of the rib or ribs behind the opening so as to obtain more direct drainage. 3. In the dorsally placed type, after drainage a rigid-walled dead space is formed which is obliterated slowly and with difficulty and tends to form tracks extending up and down for some distance from the tube; such cavities must be drained with a large tube until lipiodol injections and X rays show that the cavity has contracted down to a small circular area immediately related to the tube; this can then be removed and rapid healing may be expected. 4. Interlobar empyema possesses special risks, and the prognosis must be more doubtful than in any of the other localised forms. Delay is apt to occur in diagnosis, with resulting increase of toxæmia; efficient drainage may be more difficult and there is liability to pocketing; and bronchial fistula is a fairly common complication. In all cases of doubt as to the advisability of final removal of the tube two considerations should be borne in mind, continuation of drainage is necessary as long as there is a large amount of thick discharge or if lipiodol shows a large cavity.

BRONCHIAL FISTULA

Bronchial fistula is a more frequent complication of acute empyema than is perhaps generally appreciated, and according to some authorities occurs in as many as 10 per cent. of all cases; it is more common in children than adults. Rarely does its occurrence allow sufficient drainage to produce a natural cure; on the contrary, it is often the cause of death from infection of the other lung, from the establishment of a pressure pneumothorax by the sucking of air into the pleural cavity in a valvular manner, or by the admission of secondary infection. When rupture into a bronchus occurs pneumothorax is the usual immediate result. Such rupture is often precipitated by the sudden change of pressure while an empyema is being aspirated.

Foul-smelling pus from an empyema indicates a mixed infection and is usally present if there has been a communication with a bronchus; in the absence of streptococci the foulness of the pus is not an indication of special severity.

C. W. GORDON BRYAN, *M.C.*, F.R.C.S.,
Senior Surgeon, Paddington Green Children's Hospital;
Senior Surgeon to Out-patients, St. Mary's Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. L. A. Moncrieff placed on retd. list at own request with rank of Surg. Capt.

Surg. Comdr. (retd.) R. N. W. W. Biddulph promoted to rank of Surg. Capt. (retd.).

Surg. Comdr. G. W. Woodhouse to *Victory* for R.N.B.

Surg. Lt.-Comdr. J. M. Sloane to *Glorious*.

Surg. Lt.-Comdrs. (D) L. A. Moules to *Ganges*; F. W. Watt to *Valiant*; and R. J. M. Andrews to *Victory* for R.N.B.

Surg. Lts. B. R. Alderson to *Pembroke* for R.N.B. and to *President* for course; G. D. Webb to *Victory* for R.N.B.; A. P. C. Clark to *York*; D. C. Dobson and J. M. Holford to *Pembroke* for R.N.B.; D. W. Pratt, S. J. Van Pelt, and S. C. S. Cook to *Victory* for R.N.B.; and M. Cay and R. H. A. Turner to *Drake* for R.N.B.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. C. A. Clark to *Drake*.

Surg. Lt.-Comdrs. A. S. Bradlaw to *Victory*, and H. M. Willoughby to *Caledon*.

Surg. Lt.-Comdr. G. F. Abercrombie to Surg. Comdr.

Surg. Lt. D. Simpson transferred from list 2 to list 1 of the Mersey Div.

Surg. Lts. C. A. Mather to *Pembroke* and to *Pegasus*; E. H. Parkinson promoted to Surg. Lt.-Comdr., J. F. M. Milner to *Drake* and to *Ramillies*; and G. L. Foss (proby.) to *Drake* and to *Titania*.

R. C. Anderson entered as Proby. Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Maj. D. C. Monro to be Bt. Lt.-Col.

Capt. J. R. McDonald, M.C., to be Maj.

Lts. to be Capts.: A. G. D. Whyte, R. A. Stephen, A. J. Clyne, C. M. Fraser, D. S. Anderson, and A. D. Forgie.

ARMY DENTAL CORPS

Capt. B. Abbott to be Maj.

TERRITORIAL ARMY

Lts. H. B. Lee and C. F. Critchley to be Capts.

SPECIAL ARTICLES

THE ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

THE ninety-fourth annual meeting of the Association took place at Chandos-street and the Westminster Guildhall on July 3rd, 4th and 5th, under the presidency of Dr. **REGINALD WORTH**, medical superintendent of Springfield Mental Hospital. Among the distinguished foreign guests were Prof. M. Laignel-Lavastine (Paris), Dr. Jacques de Busscher (Brussels), Dr. Robert Largeau (Paris), Dr. Jens Chr. Smith (Denmark), Prof. A. J. Westerman-Holstyn (Netherlands), and Prof. W. Mayer-Gross (Heidelberg).

The presidential address by Dr. Worth dealt with

Four Decades of Psychiatry

Dr. Worth paid a tribute to the broad-minded policy pursued by the Middlesex County Council in matters concerning the welfare and treatment of the mentally afflicted, and alluded to the new mental hospital at Shenley, which was visited by the Association on July 5th. After criticising a number of new methods and vaunted aids, he confessed himself as much bewildered now when confronted with a case of psychosis as he was at the outset of his career, largely because the causes have escaped recognition in spite of vigilance. He had much to say in condemnation of exhibitionism, loose talk, and pornographic potboilers, which he regarded as a feature of present-day life that must lead to a very undesirable state of society. Psycho-analysis was, he said, still very controversial, and acrimonious discussion on it had not been stilled. There were numerous temperamental differences in people, involving varying response to psycho-analytic theory, but he did not deny its capacity for the elucidation of mysterious ailments of the mind. By accepting some of its postulates one could determine a fairly definite mental pathology, such as the mechanism and mode of evolution of neurosis and psychosis. But the over-emphasis of sex had given definite offence to certain individuals. In recent years he had been much impressed by the increasing amount of adolescent psychosis, and asked whether this indicated that the present generation was breeding a greater number of psychopaths. In searching for hereditary factors, the figures were largely vitiated by the wide practice of family limitation. He was inclined to impeach the complications of modern life. The problems of mental involution would ultimately, he thought, be solved in the laboratory. Dr. Worth criticised the nomenclature of mental disease, and concluded by dealing with the chemical, biochemical, and physical aspects of insanity, expressing the belief that better histological methods and further research into structure and function must contribute vastly to the elucidation of the mysteries of mental disorder which, so far, had not been cleared up. There was on foot now, he said, a movement to oust the medical superintendent from his position of head of affairs in his own hospital, the suggestion arising to appoint lay directors or managers to mental hospitals, and a move was being made to deprive mental hospital visiting committees of their statutory powers. To these proposals he was strongly opposed.

The Dissertation Prize was awarded to Dr. A. GUIRDHAM, of Brentwood Mental Hospital.

Dr. THOMAS D. POWER read a paper on

Modern Endocrinology and Mental Disorder

He said that the more recent developments in endocrinology were of great interest to the psychiatrist. The pituitary gland, which was closely connected with the diencephalon, was found to exert a profound influence not only on the rate of bodily growth, but also upon sexual development and metabolism. It exercised most of those functions through the medium of other members of the endocrine group, while the latter, in their turn, had the power of influencing the pituitary. These relationships were very complicated and not yet understood. It seemed that one of the functions of the pituitary was to supplement certain forms of nervous activity by initiating a series of chemical changes in the body, and that, in this respect, it was subservient to the organic needs of instinct. Dr. Power described a number of investigations which he had carried out, and said it seemed probable that all instinctive and emotional activities were accompanied by subtle alterations in hormonal balance, and that those, in turn, influenced neuronic processes. The pituitary had some claim to be regarded as the master gland of the body. It was easy to imagine how a profound emotional disturbance could be perpetuated by endocrine disharmony, and so prove susceptible to substitution therapy. A combination of anterior pituitary hormones suitable for hypodermic injection appeared to be a desirable therapeutic agent, but, until such a preparation was placed on the market, workers in this field must content themselves with minor laboratory and clinical experiments.

Dr. F. L. GOLLA, Prof. LAIGNEL-LAVASTINE, Major J. E. DHUNJIBHOY, and Dr. DAVID SLIGHT (Montreal) discussed the paper.

Dr. H. C. BECCLE described some recent investigations into

The Hæmatology of the Psychoses

He said that much research had been carried out in recent years on the structure and function of the blood elements, with a view to ascertaining whether there were any regular quantitative and qualitative changes in the cells which would prove of diagnostic and prognostic value in disease, and, naturally, special attention had been devoted to the reaction, if any, of the reticulo-endothelial system to psychosis. This communication was concerned with certain changes in the neutrophilic polymorphonuclear leucocytes in disease, especially mental disease, to which he had been devoting attention at Springfield Mental Hospital for some time. With regard to the sudanophil granules, it was not yet definitely established whether they were manifestations of endogenous leucocyte damage, or were true inclusion substances resulting from phagocytosis of tissue cells. Jonescu had investigated 80 cases of various acute, subacute, and chronic diseases, and found that in a large proportion of his patients the number of granules of both varieties followed somewhat closely the course of the disease. That worker came to the conclusion that a quantitative estimation of sudanophil and toxic granules was of diagnostic import, and when made at intervals gave a useful prognostic indication. Dr. Beccle therefore thought such estimations might be of value also in the psychoses. It could be stated, in a general way, that the higher the granule count the more severe was the infection or disease. He described the technique he followed, and the frequency of the various examinations. In all, 20 acute and subacute cases were investigated; 15 normal people, including members of the nursing staff, were examined; and 10 chronic cases were also submitted to these tests. More cases, and especially more controls, were required to enable an assessment to be made of normal phasic events, but certain facts emerged from information already to hand. First, the toxic granules were found in much greater profusion than the sudanophilic bodies; secondly, while there was no close quantitative relationship between the two varieties of granules, there seemed to be a serial continuity between each series of estimations taken separately. Jonescu was definite in stating that sudanophil granules should never appear in the polymorphonuclear leucocytes under normal conditions; in his view they indicated chronic, possibly latent, infection. Dr. Beccle's own view was that a toxic granule count of 9 per cent. and a sudanophil count up to 5 per cent. could be regarded as normal.

In his group of 20 psychotic patients examined in the acute stages of their disorders, there was a fairly close relation between the intensity of the psychosis and the percentage of the sudanophil granules and the toxic granules, high figures indicating severe disability. Lower counts were associated with an abatement of acute symptoms. An instructive case was that of a female schizophrenic, of reaction type, aged 34. With the improvement in her mental condition the granule count fell from 74 and 46 to 32 and 4, these representing percentages of toxic and sudanophil bodies. There was also a moderately high sedimentation-rate and total white count, and there ensued a noticeable improvement here too. In a number of the cases he was not able to retain the patients long enough to make a proper investigation, but he felt able to draw certain conclusions. The toxic and sudanophil granule estimations appeared to follow the course of psychosis, varying directly with the intensity of the disorder. The gradual improvement in the counts observed in recovering cases must be ascribed, in part, to the general detoxication which was instituted in each patient soon after admission. It would be rash to infer, from the results of so few examinations, that these estimations had definite diagnostic and prognostic value, but he suggested that they might prove of considerable assistance. The paper was discussed by Dr. Rosa Stern, and Dr. Beccle replied.

Dr. W. D. Nicol read a paper contributed by himself and Dr. E. Lilian Hutton on

Clinical Aspects of General Paralysis of the Insane

They said that before the days of malaria therapy general paralysis was regarded as an incurable disease with a fatal termination within a few years of its recognition. Some said it was not new to witness remissions of the disease which were regarded as cures, while others declared that the occurrence of remissions falsified the diagnosis. Another group held that the disease had changed in character. A Board of Control inquiry showed that of 624 untreated general paralytics admitted to mental hospitals in 1923, 90 per cent. had died by the end of 1927, and Dr. E. T. Meagher, who made the inquiry, said that complete remission of a year's duration was very rare. As to a possible change in the character and severity of G.P.I., it seemed possible that the modern arsenical treatment of syphilis had modified the subsequent development of neurosyphilis. Many patients denied syphilitic infection, and so had had no antisyphilitic treatment. A further question was whether the diminished alcoholism of the present era had been a factor in altering the picture. It must not be forgotten that a Wassermann-positive cerebro-spinal fluid did not necessarily mean that the case was one of general paralysis. There were three clinical varieties in which the serological findings were positive: (1) the true general paralytic, whom it should be possible to diagnose without laboratory help; (2) doubtful cases, having one or two vague symptoms, in whom a positive Wassermann should indicate the possibility of G.P.I. and so of therapeutic measures; (3) those in whom, during routine examination, a positive serum was discovered. Kraepelin's description of G.P.I. was "a progressive deterioration leading to complete undermining of the whole mental and physical personality, accompanied by peculiar irritative and paralytic phenomena." To-day, however, the disease was no longer a fatal one; a certain percentage of cases treated by malaria recovered sufficiently to justify their discharge, while in others the progress of the disease was arrested.

This paper was based mainly on 100 consecutive admissions of each sex. In many cases preparetic symptoms passed unnoticed for long periods, and only when they were pronounced did relatives remember less marked symptoms some time earlier. Changes in character, irritability, outbursts of temper, apathy, or emotional instability were frequent, as well as a general falling off in efficiency. Either insomnia or excessive sleepiness might be present, and slurring of speech was a very valuable sign, often an early one. Depression preceding the development of grandiose ideas was often observed. The simple dementing form was characterised by a general mental deterioration, but this must be distinguished from the type of confused paretic. Sometimes the clinical picture of the simple dementing case was tinged with a strong grandiose or confused element, and false hopes of recovery might be held out because of the presence of the confused element. Slurring of speech occurred in 80 per cent. of women patients. Increased knee-jerks and the Argyll Robertson pupil were present in about half the cases. The concurrence of tabes with G.P.I. was present in 5 women, and 6 men. Seizures very rarely occurred in the pure grandiose or confused types; they were most frequent in the simple dementing type, and were generally followed by some dementia; 23 men and 30 women had seizures. These cases with seizures were less likely than others to benefit from malaria therapy, and the seizures influenced the prognosis adversely. In 220 cases of each sex there was no patient younger than 26. Soon after 30 years of age there was a sharp rise among women, but the corresponding rise in men was delayed five years longer. After 59 in women there was a further presenile rise. A new clinical picture could now be seen, and what was once a typical paretic might be metamorphosed into a schizoid personality, while in others a hallucinatory psychosis might supervene. If a hallucinatory psychosis followed treatment, this fact was of grave significance.

A definite problem was presented by the patient who had been discharged in a good state of remission and then subsequently relapsed, and Dr. Nicol related several of these. It was matter for regret that some hospitals still precluded their general paralytics from receiving malaria therapy; no record had been published giving the fates of untreated general paralytics. The authors of this paper, however, had collected some evidence regarding untreated cases in the last ten years; 32 women and 23 men were not given treatment because of their poor physical condition on admission. Of the women, 10 were fulminating cases of the confused, manic, and depressed types; all died within seven months of the onset of the symptoms; 16 of the remaining 22 women were simple dementing types and 14 were dead within two years of the onset of the disease. No good recovery in women over 50 years of age had occurred, and only 3 men over 50 had shown a good remission. Every good remission case was ready for discharge from hospital 6 to 9 months after treatment; it could be confidently stated that if a patient was not well enough to be discharged within 9 months of the end of the treatment, hope of recovery could be abandoned. In both sexes there was a high recovery-rate in the pure confused, grandiose or manic types.

It was rational to regard the symptomatology of this disorder as due to the abnormal functioning of the brain cells affected by the infective process; this might be due to either irritation of the cells, or to their destruction, giving rise to either positive or negative phenomena. It was possible for the irritation to subside without causing any permanent damage, and then the concomitant symptoms would disappear, and a cure, or at least a remission, might occur. But when cell destruction had taken place this recovery could not occur. The grandiose delusions and the maniacal outbursts, could it was suggested, be regarded as due to irritation. In the mixed types it was rare to meet with a good recovery, and even in cases of the kind showing improvement there was always some permanent defect. The age-incidence of the disease was earlier in women than in men, but in the latter the fulminating types were more common, as also were the confused and the mixed grandiose and confused types. Sometimes the typical picture of G.P.I. was superimposed on a pre-existing psychosis, and since the use of malaria therapy the remission of G.P.I. had been demonstrated in some cases, only to lay bare the underlying mental disorder. Malaria was disappointing as a therapeutic agent for tabes, and also in its application to those associated psychoses with presumably latent syphilis. He asked whether malaria was a prophylactic weapon for preventing the subsequent development of G.P.I. In many cases following malaria therapy all serological findings became completely negative.

Dr. Nicol and his colleague held that malaria was definitely indicated in the treatment of the true case of G.P.I. Syphilis seemed to be declining in its incidence. It had become fashionable to treat many cases of general paralysis without certification and in general hospitals; during the last decade many hundreds had been so treated. Statistics as to results under these circumstances as well as those in mental hospitals were required; the recovery-rate would never reach higher proportions until the disease was diagnosed earlier by physicians and treated immediately.

The paper was discussed by the PRESIDENT, Dr. F. L. GOLLA, Dr. W. M. MCALISTER, Dr. G. M. BLAIR, Dr. RALPH NOBLE, Dr. ROSA STERN, and Dr. ROY M. STEWART.

ANNUAL DINNER

The annual dinner of the Royal Medico-Psychological Association was held on Wednesday, July 3rd, at Claridge's Hotel, London, with Dr. Reginald Worth, the president, in the chair. A large number of members and guests were present.

After the loyal toast the position of mental health in relation to medical practice was considered in an interesting speech by Prof. D. K. Henderson. He spoke hopefully of the prospects of psychiatry which, once a neglected Cinderella, had now become one of the chief problems before her elder sisters, medicine and surgery. Mental health must be regarded as part of the general problem of health. If psychiatry be neglected, the result will be appalling, for what, he asked, is the utility of many public health measures with a population below the proper mental standard? The study of psychiatry must, therefore, be more intense than it has been in the past—the population must be watched from the beginning, from birth onwards. The ideal man had been described as one with the English gentleman's mind in the body of a Greek God. Towards the physical side of this ideal much was being done and the same attention must be devoted to the mental side. We have, he said, a population of all sorts, a certain proportion of whom have a disordered mentality, and to meet the situation it is necessary that the medical profession should be better educated in psychiatric problems and that the goodwill of the public should be obtained by propaganda and the publication of satisfactory efforts. The General Medical Council, in a new scheme for a reformed curriculum recently issued, has now laid stress on the value of psychiatry, and everyone is now awake to the fact that the training of the medical profession generally should be directed in accordance with this view, which implied that the psychiatrist should find his place in a well-coördinated medical course.

Sir Arthur Robinson began by expressing the regret of the Minister of Health that he had been unable to be present to meet the Royal Medico-Psychological Association, as he had to fulfil an engagement made before the recent change of offices. The toast was the toast of "Mental Health," and he said that it was a matter of no small significance that the person who answered the toast was the Permanent Secretary of the Ministry of Health and also of Local Government. Prof. Henderson had stressed the necessity for regarding mental health as a part of the one whole problem of health. He noted that in the years since the Ministry of Health was established progress in regard to mental health had been noteworthy. For example, the relation between physical conditions and mental health had been more deeply explored, and the results of this research were fruitful. Again, in mental health as in physical health, there had been clearer recognition of the necessity for early treatment, and this was recognised by the power given by the Mental Treatment Act of 1930 to local authorities to establish out-patient clinics, and by 1934 no less than 134 of these had been established. Or again, the same Act had enabled public hospitals to receive patients without certification, and it was noteworthy that in 1934 no less than 20 per cent. of the direct admissions to public hospitals were admissions of voluntary patients. These were a few signs of progress and development. Obviously much more remained to be done. The development of relations between those responsible for mental health and between the members of the general medical profession was a matter of increasing importance, especially in regard to the extension of the relation of general hospitals to mental treatment. Again, there required to be still further education of public opinion as to the needs of mental health and what is required to make full provision for them. At this point he referred again to the linking up of mental health with general health in the areas of local government, and said that he thought that very careful consideration indeed was required before the Association committed itself to a policy in the local areas of divorcing the Mental Health

Committee from other committees of the local authority, such as the Public Health Committee. It appeared to him that in the long run better progress was likely to be secured in the conditions of local government which actually prevailed by accepting the fact that there must be the closest possible connexion between the various organs of government in the shape of the committees of a local authority.

Sir Arthur referred to the presence of Lord Macmillan, whose outstanding services on the Royal Commission on Lunacy and Mental Disorder were in the minds of all of them, and had resulted in the passing of the Mental Treatment Act of 1930, some of the results of which he had previously mentioned. He closed by bringing the best wishes of the Minister of Health to the service of mental health and to the Royal Medico-Psychological Association.

Sir *William Collins*, in submitting the toast of the Middlesex County Council, claimed as an old municipal hack, more acquaintance with the County of London, its Lieutenancy and its County Council than with Middlesex, though he had a nodding and neighbourly acquaintance with that county. He recalled the Local Government Act of 1888 when London was dealt with as an incident in rural administration, and the new County of London was largely carved out of the side of Middlesex. While the population of the County of London, he said, had been falling since 1901, that of Middlesex had grown from half a million to one and three quarter millions, a reminder that the County of Middlesex is becoming largely a dormitory for London, and the "green belt" of which many dreamt 40 years ago as the boundary of the County of London cannot now be realised, though possibly some such belt might be established around Greater London. When he was elected to the L.C.C. in 1892 and served on the asylums committee, two things, he said, impressed him particularly. One was the need of more thorough research into the pathology of insanity, and the other was the need for pensions for the asylums officers. With regard to the first he had endeavoured to promote research by inaugurating the laboratory at Claybury with the late Sir Frederick Mott as pathologist, while in 1909 he introduced into the House of Commons a Bill which became eventually the Asylums Officers Superannuation Act. In coupling with the toast the name of Mr. Alderman Button, the chairman of the Middlesex County Council, a body which had just promised £100,000 to the University of London, he recalled the fact that Mr. Button sat for a time in the House of Commons but was now pursuing the interests of both physical and mental health in the serener atmosphere of municipal life.

The toast was replied to by Mr. Alderman Howard Button, who referred to Middlesex as the county, save Rutland, with the smallest acreage, and an enormous population. The county was responsible for the conduct of two admirable mental hospitals, those at Shenley and Springfield, though the institutions were actually in Buckinghamshire.

The toast of the visitors was proposed by Dr. W. G. Masefield, who said that the assembly of guests was very representative, including visitors from Belgium, Denmark, France, Holland, and the United States of America, all of whom were in the charge of the members of the Association, on "a purely voluntary basis." The toast was replied to by Lord Macmillan and Lord Wakefield.

Dr. Robert Hutchison, president of the Royal Society of Medicine, proposed the toast of prosperity to the Royal Medico-Psychological Association, coupling it with the name of Dr. Worth, who briefly replied.

MATERNAL MORTALITY AND NUTRITION

A NEW INQUIRY

THE People's League of Health has established a committee to consider the nutrition of expectant and nursing mothers in relation to maternal mortality and morbidity.

At an inaugural luncheon held at Claridge's Hotel, London, on July 5th, Dr. C. O. HAWTHORNE, chairman of the council of the League, said that its reports were intended to inform and arouse public opinion and official action. The immediate object of the new committee was to study the question of food in relation to the health of the mother and to inquire what part was played by quantitative or qualitative errors of diet in the pathetic chapter on maternal mortality and morbidity. The solution of this grave problem would not be found in emotional appeals or in exaggerated statements, and still less in panic.

Lord HORDER, welcoming the enterprise, declared his belief that the core of the problem of maternal mortality and morbidity did not lie in any shortcomings of the doctor or midwife, and that the orientation of study should be shifted in the direction of the fitness of the mother to bear her child. Other attempts to solve the problem had failed, but this one had not been tested. The word nutrition must be read in the widest possible sense. Probably physical fitness, mental fitness, and biochemical fitness all contributed to the nutrition of the expectant and nursing mother.

Prof. JAMES YOUNG also commended the object of the League in this matter, but at the same time emphasised the importance of the obstetric aspect of the problem. Much maternal mortality had its origin in the ineffective standards of service brought to bear on the practical application of the subject. The investigations in Rochdale were extremely relevant; until recently this area had had the highest maternal mortality in the country but, as the result of a comparatively simple effort to improve the obstetric service, the mortality had come down in the most gratifying and dramatic manner. There was in addition a large group of conditions operating adversely, for example, the toxæmias and metabolic disturbances. There was strong evidence that some defect in the diet of the mother might be operating. The possibility could not be eliminated that in death from puerperal sepsis after normal labour there might be some factor determined by inadequacy of nutrition during pregnancy. Many conditions of pregnancy were directly related to diet, as, for example, the condition of the teeth. Nor must the child be forgotten; the condition of the mother had a great effect on the teeth and bones of the child and in this way the obstetric welfare of the third generation might be affected.

Dr. R. VEITCH CLARK suggested that the relationship between nutrition and pregnancy was probably biochemical; the word "nutrition" must be taken in its widest possible sense. He was not satisfied that there was any relation between maternal mortality and morbidity and the amount of food taken. Even the establishment of definite negatives would be a contribution of no little consequence.

Mr. Victor Bonney advocated the election of a small subcommittee for research: the services of people with both knowledge and time were essential for success.—Miss Olga Nethersole reported that the Royal College of Physicians of London at its next meeting would consider the appointment of a representative on the new committee.—Dame Louise McIlroy said that the investigation would entail two or three years' hard work, and the workers would probably find themselves up against some unknown quality in the patient herself.—Sir Comyns Berkeley observed that the subject was very complex.

A list of members of the committee follows. Asterisks denote that they are members in an advisory capacity only.

Sir Comyns Berkeley, F.R.C.P., consulting obstetric and gynæcological surgeon to the Middlesex Hospital, London.

Mr. Victor Bonney, F.R.C.S., gynæcological surgeon to the Middlesex Hospital.

Dr. J. J. Buchan, medical officer of health for Bradford.

*Dr. W. L. Burgess, medical officer of health for Dundee.

Prof. F. J. Browne, F.C.O.G., director of the obstetrical unit, University College Hospital, London.

*Prof. E. P. Cathcart, M.D., F.R.S., regius professor of physiology in the University of Glasgow.

Dr. R. Veitch Clark, medical officer of health for Manchester.

Miss M. L. Clark, L.L.A.

*Dr. G. P. Crowden, reader in industrial physiology at the London School of Hygiene and Tropical Medicine.

Prof. S. Lyle Cummins, M.D., David Davies professor of tuberculosis, Welsh National School of Medicine.

*Sir Henry Dale, F.R.C.P., F.R.S., director of the National Institute for Medical Research, Hampstead.

*Prof. L. S. P. Davidson, M.D., regius professor of medicine, University of Aberdeen.

*Prof. J. C. Drummond, D.Sc., professor of biochemistry at University College, London.

*Dr. J. S. Fairbairn, consulting obstetrical physician and gynæcologist to St. Thomas's Hospital, London; president of the College of Obstetricians and Gynæcologists.

Dr. Letitia Fairfield, a senior medical officer of the Public Health Department, London County Council.

Prof. Amy Fleming, F.C.O.G., director of the obstetrical and gynæcological unit, Royal Free Hospital, London.

Prof. W. M. Frazer, M.D., medical officer of health for Liverpool.

Dr. John Guy, medical officer of health for Edinburgh.

Sir Leonard Hill, M.B., F.R.S., late director of applied physiology, National Institute of Medical Research.

*Mr. Eardley Holland, F.R.C.P., obstetric and gynæcological surgeon to the London Hospital.

Prof. J. Johnstone Jervis, M.D., medical officer of health for Leeds.

Dr. R. C. Jewesbury, physician in charge of children's department, St. Thomas's Hospital, London.

*Colonel P. S. Lelean, F.R.C.S., professor of public health in the University of Edinburgh.

Dr. Helen Mackay, physician to the Queen's Hospital for Children.

*Sir Robert McCarrison, F.R.C.P., past director, Nutritional Research Pasteur Institute, Coonor, India.

Dr. A. S. M. Macgregor, medical officer of health for Glasgow (corresponding member).

Dame Louise McIlroy, F.C.O.G., late professor of obstetrics and gynæcology, University of London.

*Mrs. Ian Murray, Ph.D., of the University of Glasgow.

Dr. Elwin H. Nash, medical officer of health for Heston and Isleworth.

*Sir John Boyd Orr, M.D., F.R.S., director of the Rowett Research Institute, Aberdeen.

Dr. Thomas Orr, medical officer of health for Ealing.

Dr. W. H. F. Oxley, hon. medical officer, East End Maternity Hospital, London.

Dr. Eric Pritchard, pædiatrician to Queen Charlotte's Maternity Hospital, London.

Dr. H. J. Rae, principal medical officer of health for Aberdeen.

*Sir John Robertson, M.D., late medical officer of health for Birmingham.

Dr. G. W. Theobald, consulting obstetrician and gynæcologist, St. Mary Abbots Hospital, Kensington.

Sir Pendrill Varrier-Jones, F.R.C.P., director of Papworth Village Settlement, Cambridge.

Miss Jean Wishart, matron, Queen Mary's Maternity Home, Hampstead.

Prof. James Young, F.C.O.G., professor of obstetrics and gynæcology at the British Postgraduate Medical School, London.

MEDICINES AND SURGICAL APPLIANCES (ADVERTISEMENT) BILL

DEPUTATION TO THE MINISTER OF HEALTH

Sir Kingsley Wood, the Minister of Health, who was accompanied by Sir Edward Campbell, received a deputation on July 4th from the Parliamentary Committee on Food and Health.

The speakers were Lord Mamhead, Captain G. S. Elliston, Sir John Pybus, and Sir Francis Fremantle. The associations represented were:—

Advertising Association; Association of Municipal Corporations; British Medical Association; County Councils Association; Institute of Incorporated Practitioners in Advertising; Newspaper Society; Periodical Trade Press and Weekly Newspaper Proprietors' Association, Limited; National Association of Insurance Committees; Pharmaceutical Society of Great Britain; National Pharmaceutical Union; Surgical Instrument Manufacturers' Association Incorporated; Society of Medical Officers of Health; Parliamentary Medical Committee; and Parliamentary Committee on Food and Health.

Lord Mamhead, in introducing the deputation, recalled the fact that the Parliamentary Committee on Food and Health had first been constituted at a meeting held in 1911 and called by Dr. Addison, Lord Bledisloe, and others. It had always been a non-party and a lay body.

Captain Elliston said that the committee had had in preparation for some time the draft of a Bill to control the advertisement of medicines and surgical appliances. A Select Committee of the House of Commons, the appointment of which arose out of action taken by the Parliamentary Committee, investigated the question in 1912–14 and reported in favour of legislation. Several endeavours had been made since then to introduce legislation, but it had not been possible to make progress with a Bill. One of the difficulties had been that, in the past, it had been impossible to secure the agreement of the many interests concerned. The present Bill had been discussed with all the important interests affected, and a measure of agreement, never previously attained, had now been reached. The principal objects of the Bill were:

(1) To prohibit the advertisement of medicines, surgical appliances, or forms of treatment as effective for the cure or prevention of certain specified ailments, such as cancer and consumption, and

(2) To prohibit the publication of invitations to members of the public to obtain the diagnosis or treatment of these ailments by correspondence.

The Bill also contained clauses safeguarding the legitimate interests of those concerned, including newspapers and religious organisations.

Sir John Pybus, speaking as president of the Advertising Association, said that the Bill, if it were accepted in its entirety, would not affect adversely any legitimate trade interest. It would, indeed, be helpful to the existing work of the department of the Association charged with the voluntary regulation of advertisements. Although the Newspaper Proprietors' Association had not committed itself to support of the Bill, its representatives had taken part in the drafting of the Bill and, in view of the safeguards for the newspapers which the Bill contained, there was no need to anticipate any opposition from this Association.

The Minister of Health, in replying to the deputation, expressed appreciation of the valuable work done by the Committee, and congratulations upon the great measure of agreement secured for their Bill. Although much useful work was being done voluntarily, and many newspapers already set a very high standard in the matter, legislation was undoubtedly needed. The subject was one in which he had himself long taken interest and, at the time when he was previously connected with the Ministry of Health, legislation had been contemplated. It had not, however, then been possible to proceed with a Bill. The deputation would not expect him to give at the present stage any definite undertaking that the Government could introduce legislation. Nevertheless he would have the Bill examined and would make further inquiries as to the amount of support which might be anticipated for it. If these inquiries proved satisfactory he could assure the deputation that the introduction of legislation would be considered sympathetically, if the Government's general programme of legislation made this possible.

Sir Francis Fremantle expressed the thanks to the Minister on behalf of the deputation for their reception.

FACTORIES AND WORKSHOPS IN 1934

The Annual Report of the Chief Inspector of Factories and Workshops for 1934[1] has just been published. The year showed continued development of industry, notably in the south. More than half a million persons have been attracted towards London during the past seven years by new industries, representing an increase of some 27 per cent. of insured workers in the south-east. There was also evidence of a revival in some of the industries in the north, and in several places redundant cotton mills and weaving sheds are being converted to new purposes. Electric arc welding and the selenium cell are taking an increasing place in industry, and are playing a part in accident prevention. There has also been a revival in some of the rural industries, notably the production of Harris tweed. At the end of the year under review, the Department had on its registers 162,922 factories and 83,110 workshops, an increase of 2737 factories and a decrease of 3741 workshops on the preceding year. The Department received 3685 complaints, most of which related to conditions of employment; about half of them were substantiated upon inquiry. It also took part in a number of conferences.

One concerned a disaster in a bleaching works involving the death of four boys, and resulted in the formation of a committee to investigate the special risk. Two other conferences were undertaken in an attempt to design a code of rules to protect workers from the ill-effects of dust in the malting industry. Another considered steps to prevent danger to health from substances newly introduced into chemical manufacturing industries.

LIGHTING AND NOISE

Advance in lighting efficiency generally has not kept step with progress in such matters as fencing and ventilation. Most foundries are still poorly lit, though in some instances a very high standard has been reached.

Most of the workshops where clothing is made suffer from severe glare; employers and operators alike do not or will *not understand the necessity for reflectors of a suitable* type. Potteries and steel-tool cutlery and silversmiths' trades also suffer largely from bad illumination; the danger is not confined to eye-strain, but may result in accidents of various kinds. Some artificial silk and hosiery works have improved the lighting of their intricate processes very considerably, tilting the machines to obviate glare from the needles and providing local points easily adjustable to various heights of knitting frames. The Report mentions one recently equipped vitreous enamelling department where walls, floor, and ceiling are dead white, lighted with 350-watt bowl-spread lamps without reflectors. The result is complete absence of both shadow and glare. The excessive lighting contrasts often found in printing and book-binding works have been found to cause headache and eye-strain, which have in most cases been completely obviated by better general illumination. In some large steelworks and foundries, mercury-vapour lamps have been installed, and are claimed to be particularly suitable, because they are economical in consumption and give a high output of light with the elimination of glare and shadow.

The Report reviews a number of types of noise, both continuous and sporadic, which are encountered in different departments of industry. The most striking feature is the amazing tolerance of the workers. In weaving sheds, for example, the operators can talk quite easily where a casual visitor can hardly speak above the din.

Operators practically never complain of noise; complaints all come from residents in the neighbourhood. The Industrial Health Research Board has studied the effect of noise on efficiency and accidents and has detected a slight and persistent increase in output when ear protectors were provided. It seems reasonable to expect that a sudden noise might precipitate a mishap but there is no clear case on record. The only accident in which noise played a part was that of a man who went to oil a squeaking machine, contrary to rules, because he was irritated by it. The Department feels that the problem of the reduction of noise is, in the main, one for the designers of buildings. Individual firms have, however, tackled the problem with a good deal of success by lining departments with sound-absorbing felt or asbestos, walled between boarding, and by replacing old mechanisms by modern ones. Ear defenders were much appreciated by workers in a nail-making factory and by men testing aircraft engines; in other places their reception was mixed.

SAFETY IN INDUSTRY

The total number of accidents reported during 1934 showed an increase on those of 1933, no doubt largely reflecting the general increase in industry. The chief inspector fears that an increase in accidents must long remain the price to be paid for prosperity.

There were 785 deaths and 136,858 injuries. Transmission machinery accounted for 1,143 accidents, 38 of which were fatal; *and defective belt shifting accounted for a* number of serious accidents through machines suddenly starting when the workers did not expect it. Similar accidents were attributable to human carelessness. Fire, although not uncommon in industrial premises, did not cause much loss of life or injury, though one distressing outbreak caused the death of two boys in the celluloid store of an electric accumulator factory.

An improvement in trade conditions has been accompanied by a revival of interest in accident prevention. There is a tendency to abolish the safety committee and appoint a safety officer instead, but this practice is not regarded favourably by the Department. It is considered better to encourage the workers to take a keen personal interest in their own safety than to lead them to think that the employers regard safety as a matter for the management. Reports from various parts of the country are sometimes encouraging and sometimes unsatisfactory. One interesting innovation is that, in a certain works, carefully selected workmen have been appointed as "safety associates" for a period of three months. During that time their duty is to bring to the attention of the safety committee any dangers or risks which might otherwise escape notice. They will be replaced periodically by others. In another works a class of boys has been organised for instruction in safety principles and first-aid. The high accident-rate among young workers is specially mentioned by the Chief Inspector, who urges the importance of educating not only new entrants but also school-children. In a large gas works every accident is investigated by a jury of twelve workers. A chemical works in Wales succeeded in winning outright (having won it five times) a fine safety trophy competed for by a group of eight works, six in America and two in this country. Their record was 609,000 man-hours without a single lost-time accident from Dec. 13th, 1933, to Jan. 17th, 1935.

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[1] H.M. Stationery Office, Kingsway, W.C.2, pp. 121, 2s. net.

Trade conferences have continued to meet to discuss safety in their particular trades. An investigation showed the value of these conferences by revealing that 12 per cent. of the accidents in a particular district would not have occurred if the precautions recommended by the trade conference of that industry had been carried out.

HEALTH IN INDUSTRY

Many attempts have been made to devise a system in which sickness-rates in industry can be recorded, and the health of industrial workers compared with that of the rest of the population. No satisfactory method has ever been discovered. In the opinion of Dr. J. C. Bridge, senior medical inspector, most ill-health in industry arises outside the factory. He thinks medical supervision is of the greatest value in assessing the gravity of minor sickness, since the boredom associated with repetitive work is likely to increase the significance attached to such sickness by the worker, and thus to increase the length of his absence from work. Medical supervision has also much value in counteracting the effect of irresponsible sickness certificates such as "gastritis due to employment." The effect on the health of the worker of the allegation that his illness is due to his work may be very grave. It would be much better if practitioners who suspect such a possibility would communicate with the Factory Department, in order that the diagnosis be made only after full investigation.

Experiments have been made in a few factories towards reducing the hours of heavy manual work, but there has been a regrettable tendency to employ workers under the age of 18 to the full limit of the legal hours. The reduction in cases of lead poisoning has not been maintained, chiefly because of the increase in the building of houses and an influx into the industry of untrained persons. Several steps have been taken to ensure the observance of the Pottery Regulations. There were only nine cases of aniline poisoning, the lowest since the disease became reportable. There were three fatal cases of benzene poisoning which is of interest in connexion with the study of aplastic anæmia. The extended use of chromium plating has been accompanied by an increase of chrome ulceration, and the industry does not seem to appreciate the value of frequent medical examination. Regular medical supervision seems to have a definite relationship also to the percentage of deaths from industrial skin cancer, which particularly affects cotton workers and gas workers. There have been no new cases of cancer of the nasal sinuses, to which attention was drawn in previous reports, but two further deaths have occurred among the cases previously reported. There is a suggestion that the condition may be associated with cancer of the lung, and the firm is doing its best to suppress all dust. The appearance of hand-made bricks and tiles has caught the fancy of the public, and there is a demand for them; they can be imitated cheaply by machinery which involves a process of sand-dusting. This exposes the worker to siliceous dust and will, in the opinion of Dr. Bridge, result in an increase of silicosis if precautions are not taken. The number of cases of dermatitis have very greatly increased, but this does not necessarily imply that the number of persons infected has increased in proportion. The causal agency is often obscure, and there is a tendency to ascribe any skin condition to the employment unless it is well recognised as a non-industrial type. A susceptibility test does not seem to be practicable, and the industries have to fall back on protection and care of the skin.

FIRST-AID AND FACTORY WELFARE

Most of the larger factories have good first-aid facilities but in the smaller factories the conditions are not good and in many cases the supply of dressings is inadequate. In one division no less than 30 prosecutions were taken against factory occupiers for failure to provide or maintain first-aid boxes. Carron oil is still supplied in first-aid boxes and is often used in preference to a burn dressing or other suitable preparation. The report suggests that local chemists might be circularised and informed of the type of dressing which will conform to the regulations.

There is some difficulty in getting workers to report slight cuts and scratches, and in one division three inquests were held on deaths from sepsis after minor injuries. Dr. Bridge, commenting on the attacks that have recently been made at inquests on the use of iodine for wounds, finds it difficult to understand why such a useful preparation should be held responsible for the fatal issue, as it was in one case of punctured wound, seeing that it is most difficult to render a punctured wound aseptic.

There is a rapidly extending improvement in the production of voluntary welfare amenities: comfortable chairs, small tables, pleasant colour schemes, and good messrooms. In a number of instances the appointment of women supervisors has entirely changed the atmosphere of the works. Internal discord, lack of discipline, and minor irregularities have been known to disappear completely on the appointment of a woman welfare worker or nurse. In other respects the personal factor is being considered more and more; for example in one factory a worker who has a relative undergoing an operation in hospital or seriously ill leaves his name and number at the office when clocking in. At intervals the office clerk telephones the hospital and keeps the worker informed of the patient's progress. In many places systematic efforts are made to trace symptoms of discontent to their origin and to remedy grievances. Several firms have realised the wastefulness of selecting entrants by putting a notice in the window, or applying to an employment exchange. One firm discovered that it had to engage 1000 people to select 200 suitable for their work, and are now thankful for the services of a trained psychologist. A large hosiery firm has experimented with prism lenses for employees engaged in linking fine-gauge hosiery.

The four women who tried the glasses for six weeks were so enthusiastic that every linker immediately asked for them, and now the supply of prism lenses has been extended to all the workers. The firm undertook to pay the oculists if National Health Insurance benefit was not available, and qualified opticians supplied the glasses at contract prices. Special consideration was given by the oculist and optician to the distance at which each linker worked, so that the glasses were suited to the individual. All the linkers who were examined by the oculist were found to have a refraction error, and in all but one case there was imbalance of the muscles. The amount of bad work is said to be greatly reduced.

The report closes with a short chapter on the Home Office Industrial Museum, which has attracted a considerable number of visitors, though as yet too few from among actual factory workers. Many examples have been furnished of the practical effects of a visit to the Museum, to which an extension is to be opened in the autumn.

OXFORD OPHTHALMOLOGICAL CONGRESS

THIS congress was held in the Department of Human Anatomy, Oxford, on July 4th, 5th, and 6th. At the opening session the retiring Master, Mr. Cyril Walker gracefully installed his successor Mr. Russ Wood, who then called upon Sir Harold Gillies to read his address on

PLASTIC SURGERY OF THE EYELIDS AND CONJUNCTIVAL SAC

Sir Harold pointed out that in plastic surgery a successful result was dependent on a correct diagnosis, particularly with regard to the amount of skin requiring replacement. This was often very much more than appeared at first sight, especially in cases of cicatricial ectropion. The best results were obtained with skin from one of the other eyelids, and failing this, from the back of the ear. If after operation the graft were found to be too pale it could be given a natural colour by tattooing. Another important general principle was to excise all scar tissue; this applied with particular force to cases of contracted sockets. Sir Harold showed many lantern slides of patients and a cinema film illustrating the general principles of plastic surgery. He also showed a series of 25 patients who had been the subject of plastic operations with remarkably fine results.

PAPERS AND DISCUSSIONS

In the afternoon, Mr. Tudor Thomas gave a description of *The Technique of Corneal Transplantation*. The operation was described in detail. Stress was laid on the importance of having a healthy donor cornea, of preparing the graft, and the hole in the recipient cornea. Mr. Tudor Thomas pointed out that the steps in the operation had been elaborated by experimental work on animals, and this work had been particularly valuable in ascertaining the best means of securing the graft in position. From the results obtained in 15 suitable cases, it appeared that material improvement could be expected from this operation in 75 per cent. of cases with opaque cornea, where the eye was otherwise healthy.

This paper was followed by a discussion on the *Results of Treatment in Retinal Detachment*. Mr. R. Affleck Greeves said he had treated 70 cases by Larssen's method of diathermy combined with trephining of the sclera and puncture of the choroid by a Nettleship's dilator. In 36 cases there was complete reposition of the retina with some improvement of visual acuity. Prognosis was found to depend mainly on the length of time the detachment had existed, the size and number of holes and the height of the intraocular pressure. The degree of myopia and the condition of the vitreous were not important factors. It was suggested that a hole never developed behind the equator of the eye, and that the so-called holes at the macula did not involve all the thickness of the retina. Aphakic cases gave poor results, only one out of five being successful.

On Friday morning, Colonel H. H. Smith spoke to his paper on *the Generation, Circulation, and Function of the Aqueous and their bearing on Cataract and Glaucoma* which had previously been circulated. He rejected the theory that the aqueous is a dialysate and suggested that it was secreted by the ciliary epithelium, drawing an analogy between these cells and those of the renal tubules. He also emphasised the importance of the pump mechanism of the scleral spur in bringing about drainage of the aqueous.

Mr. W. S. Inman then read a paper on *Emotional Factors in the Causation of Diseases of the Eye*. He gave many instances of eye diseases whose inception and course were influenced by some psychological upset though he had to invoke unconscious mechanisms to show the processes involved. Among his cases were some of acute glaucoma, ocular hæmorrhage, keratitis, irido-cyclitis, styes, and tarsal cysts. A lively discussion ensued.

In the afternoon, Dr. Ejler Holm, of Copenhagen, described a case of *Bilateral Cyclitis with Transverse Calcareous Band* occurring in a girl of 15 with typical Still's disease. The eye trouble had begun at the age of 5. The association of iridocyclitis with Still's disease is apparently rare, because the lecturer had been able to discover only one other case in the literature though there were several examples of iridocyclitis associated with polyarthritis in children.

Mr. Frederick Ridley read a paper on the *Permeability of the Cornea*. This is a subject which has not been investigated lately, largely because Leber in 1873 showed that it required a pressure of 200 mm. Hg to force water through a piece of excised cornea. Recent work shows however that the cornea acts as a semipermeable membrane, the permeability being greatest over the region of Schlemm's canal. This is because Descemet's membrane is relatively impermeable. If the cornea be in contact with blood-serum, its permeability is increased by 50 per cent.

Mr. Bernard Chavasse read an interesting paper on *Tests for Retinal Correspondence* and showed some ingenious instruments and slides he had devised for this purpose. Retinal correspondence, he said, is best investigated by the production of after images, which are different in the two eyes. He also suggested a valuable method of estimating stereoscopic vision, based on the principles laid down by Snellen for the measurement of visual acuity.

The afternoon session ended with a paper by Mr. Arnold Sorsby on *Skeletal Changes in some Congenital Eye Lesions*. These are commoner than is thought, and Mr. Sorsby urged his hearers to submit their patients with congenital eye lesions to a full general examination. He gave as examples of osseous deformities syndactyly, associated with aniridia; arachnodactyly associated with subluxation of the lenses, and polydactyly with retinitis pigmentosa. The present classification of cranial deformities was in a chaotic condition and Mr. Sorsby attempted to reduce this chaos to some degree of order by showing the difference between various cases of so-called "oxycephaly." He suggested that the use of this term should be restricted to cases with certain definite characteristics.

On Saturday morning Dr. BERNARD SAMUELS, of New York, read a paper on the *Recessus Hyaloideus Capsularis.* This is a space bounded posteriorly by the hyaloid membrane of the vitreous, anteriorly by the posterior capsule of the lens, and medially by Egger's line. Its size varies considerably and it can be examined by the slit lamp. In health it contains fibres arising from the vitreous. In glaucoma and diabetes the space has been found to contain pigment globules; in cases of injury, red blood-cells; in cases of uveal sarcoma, tumour cells.

Dr. GEORGE YOUNG described a modification of his operation of *Double Sclerectomy in Glaucoma.* After the trephined discs have been removed from the sclera, a special type of needle threaded with two pieces of silk is passed through one trephine hole and out of the other. One end of each piece of silk is cut short and the other is left just protruding from the conjunctival wound. At the end of eight days, each piece of silk is drawn out about 3 mm. and eight days later, they are removed entirely. The use of this seton obviates the need for massage of the globe after operation.

The last paper of the congress was read by Dr. D. V. GIRI on *Tebeprotin Therapy in Diseases of the Eye.* Tebeprotin, he said, was used with favourable results in disease of the eye as far back as 1922. It is a chemically pure protein derived from the human tubercle bacillus and the dosage can be exactly determined. It acts probably in a non-specific manner and is often of service in eye conditions which are not tuberculous. Dr. Giri gave an account of five cases in whom he had employed this remedy with satisfactory results. The injections were made subcutaneously below the clavicle, but he intends later to try subconjunctival injections, in view of the striking results obtained by Ilona Krasso.

DOYNE MEMORIAL LECTURE

This lecture was given by Mr. MALCOLM HEPBURN on June 5th. After a tribute to the founder of the congress, he went on to discuss the general principles governing the movement of pigment. He mentioned that apart from retinal moles and congenital pigmentation of the retina, pigmentary deposits were very rare in primary retinal diseases, whereas in disease of the choroid the pigment was always disturbed. This disturbance might be late in its occurrence, and in some cases might not be visible with the ophthalmoscope, even though subsequent histological examination proved its existence. Although differences in detail gave rise to a large variety of ophthalmoscopic pictures, the underlying pathology of many apparently diverse fundus conditions was the same. In spite of this, however, some kind of classification was essential and the lecturer suggested that the following five categories would include all choroidal disease: (1) inflammatory, (2) vascular, (3) colobomatous, (4) hyaline degenerative, (5) traumatic. The variations in the vision and visual fields in each type of case were discussed and their implications commented upon.

CONCLUSION

No account of the Oxford Ophthalmological Congress would be complete if allusion were made only to scientific communications. Nearly all the members are accommodated in Keble College, and live an undergraduate type of life for three days, having meals together in hall and meeting afterwards in the junior common room. A vast amount of shop is talked, and the information gathered is often of great value; moreover members have an opportunity of getting to know each other in a way that would be impossible were they all living in different hotels. There is a pleasant informality about the whole congress which makes it the finest busman's holiday that any ophthalmic surgeon could take.

The annual dinner was held on July 4th at Keble College. The Master alluded in his speech to the loss the congress had sustained through the death of Prof. Arthur Thomson, who had been its firm supporter since 1910. It was entirely owing to his kindness that the anatomical department of the university had been made available for the holding of these meetings.

The arrangements this year were, as usual, most efficient; the display by various firms in the commercial exhibition was much appreciated.

PUBLIC HEALTH

Special Schools or Special Classes?

THE conference of the National Special Schools Union, held recently in Edinburgh, provided an exceptionally attractive programme. One of its more interesting discussions centred round a controversy which, although old, has been recently revived—namely, what are the relative merits of special schools and special classes in the training of the mentally defective ? It soon became obvious that there was very little support of the latter alternative in the conference, its only defenders being two speakers from Leicester, where an interesting experiment is in progress in the education of retarded children in single classes. But as these children are not officially certified as defective, the classes are not technically "special" classes. It is true that Prof. Drever, the professor of psychology in Edinburgh University, who was described on the programme as presenting the case for special classes, did in the early part of his address speak of the present system of special schools as "wrong and quite indefensible," but it soon emerged that his real objections were not to special schools as such, but to the medical certification of mental defect which is still necessary for educational purposes and to the inclusion in special schools of children of low grade. The present school provides chiefly for children with intelligence quotient ranging from 50 to 70 approximately. His plea was for schools to educate children with quotient between 60 and 80. His proposals were therefore essentially those of the Wood Report of 1929, and he seemed to carry the sympathy of his audience very largely with him.

The question is largely one of population. Any area with a school population over 8000 should be able to maintain a special school. Below that level special classes in ordinary schools are the only possibility, but there are also areas where even a special class is an impossibility and where, therefore, the defective child has to be dealt with as a unit of an ordinary class. One county authority has a travelling inspector who periodically sees these children and gives advice on their individual tuition. Granted the necessary population, however, there is no question that the advantage educationally is with the special school which admits of a grading of the children and a consequent limitation of the range of capacity in any one class which is unattainable in a special class. The child has the further advantage, which was emphasised by Mr. Kennedy Fraser, the psychologist to the

Glasgow education authority, of a change of teacher from time to time, while the teacher, instead of being an isolated unit working with colleagues ignorant of and often unsympathetic with the difficulties of teaching "special" children, has the opportunity of sharing the experience of other teachers and discussing the problems raised by the individual children. If it be contended, on the other hand, that the special class gives the child the opportunity to mix with normal pupils and does not emphasise his segregation as the special school does, it can be replied in the words of Mr. Kennedy Fraser that defective children are "not too dull not to be acutely aware of their deficiencies when brought into contact with these normal children," deficiencies which make them often objects for the derision of their fellows and sometimes even of their teachers. In an ordinary school the subnormal child can be made to feel that he has possibilities of achievement.

If special schools encounter discredit in any area, it is most usually because children of too low a grade of defect are admitted who are, therefore, not strictly educable. The remedy for this, of course, is a raising of the standard of admission and the abolition of certification of defect so as to include larger sections of retarded children than is now legal. This would incidentally, by increasing the numbers of children who might be included, have the effect of justifying authorities in the establishment of "retarded schools" in areas where special schools are, under the present conditions, impossible. As Prof. Drever said, "the use of the term 'mentally defective' was an initial mistake" and too often has resulted in futile attempts to educate children really ineducable though perhaps trainable to a limited degree in respect of habits and simple tasks. Apart from official definitions of grades of deficiency, we have to *distinguish* those who are (1) ineducable and untrainable, (2) ineducable but trainable, (3) educable. The first two classes should not be under the care of education authorities. What is required is more concentration upon the educable and particularly the high-grade educable child who can undoubtedly, with suitable training—general and occupational—be socialised. The day special schools in particular have given ample proof of this possibility. The standard of admission naturally varies greatly in different areas, but there is probably on the whole better control of selection in the management of day special schools than of residential schools which tend too often to attract to themselves low-grade cases, and high-grades only when they present behaviour problems. It was admitted by one of the speakers at the Conference that about a third of the children now admitted fail to justify the hopes of their teachers. There must inevitably be children on the border line who should be admitted for varying periods on probation, but a raising of the standard of children selected would undoubtedly be of advantage in so far as it would permit the admission of high-grade children whom medical officers hesitate to certify but who obviously require some form of special education.

In striking contrast to Prof. Drever's utterance was that of a speaker at another session who, in support of the theory that juvenile delinquency is due mainly to mental defect, envisaged an extension of this term to include children up to an I.Q. of 90. His failure to give due weight to emotional factors in the causation of delinquency was criticised by other speakers and his use of the term defect received no support. Let the term defective be reserved for those obviously or proved by trial to be social misfits and its use as a necessary preliminary to education be abandoned.

Water-supplies National and Local

This year's presidential address to the Society of Chemical Industry was devoted to national water supplies—a subject that comes well within the purview of the Society since water is a chemical compound supplied in greater amount and in higher purity (seldom less than 99·95 per cent.) than any other. Mr. Edwin Thompson made it clear that there has been no national water policy in the past; indeed he maybe said to have shown that as yet we are only beginning to obtain data which may some day allow a national policy to be settled. The flow of the Thames has been gauged with some precision for about forty years, but the flow of most of our rivers is merely a matter of surmise, although the rainfall from which that flow is derived is well studied.

Mr. Thompson is not a believer in the possibility of the "water grid" and he quoted Mr. R. G. Hetherington as pointing out that an electric main costing a certain sum will supply over 36 times the population which a water main costing the same amount would supply, even assuming gravitational propulsion.

He raised another question —the softness of water—which was discussed rather more fully by Dr. Ernest Suckling and Mr. Philip Porteous in a paper read before the recent annual meeting of the British Waterworks Association. Suckling and Porteous set forth the reasons which led the Cambridge Water Company to soften their water from 18 down to 8 degrees of hardness and to do this by a base exchange process rather than by lime. It is interesting to know that the less cost of base exchange was a determining factor. In his part of the paper Dr. Suckling considered "the possibility of the desire and demand for soft water to become a craze or fashion not altogether to be commended"—a possibility which the president of the Society of Chemical Industry also had in mind. Whilst agreeing that there is an absolute necessity for a regular intake of calcium in the diet for normal development and the preservation of health he said there had been little medical support for the view that deficiency of calcium in water is responsible for dental defects and rickets. He holds that the advantages of water softening fully justify the cost.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 29TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 1; scarlet fever, 1563; diphtheria, 904; enteric fever, 62; acute pneumonia (primary or influenzal), 521; puerperal fever, 44; puerperal pyrexia, 121; cerebro-spinal fever, 14; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 7; relapsing fever, 1; dysentery, 5; and ophthalmia neonatorum, 122. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 2nd was 2753, which included: Scarlet fever, 811; diphtheria, 1000; measles, 43; whooping-cough, 377; puerperal fever, 24 mothers (plus 5 babies); encephalits lethargica, 270; poliomyelitis, 2. At St. Margaret's Hospital there were 21 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London there were no deaths from small-pox, 3 (0) from enteric, 19 (1) from measles, 4 (0) from scarlet fever, 17 (6) from whooping-cough, 17 (4) from diphtheria, 41 (8) from diarrhœa and enteritis under two years,

(*Continued at foot of opposite page*)

CORRESPONDENCE

THE FUTURE OF PHARMACY

To the Editor of THE LANCET

SIR,—In his presidential address to the British Pharmaceutical Conference, on which you commented last week, Dr. F. W. Crossley-Holland deplored the falling-off in the business of the pharmacist so far as the compounding of "drugs and galenicals" is concerned and urged his hearers to turn their attention to laboratory diagnosis. "It would," he said, "be of the greatest assistance to the doctor if he could depend upon the pharmacist to undertake the examination" of pathological specimens.

May I be permitted to question this statement? Its truth depends upon two assumptions: firstly, that the facilities for the examinations referred to are not at present fully available to medical practitioners and, secondly, that pharmacists are suitable persons to undertake them. As to the first assumption Dr. Crossley-Holland ignores the fact that there are already throughout the country a large number of laboratories established for the purpose of doing the work which he proposes should be taken over by pharmacists, the services of which are generally available to medical practitioners caring to make use of them. The majority of these laboratories are attached to voluntary hospitals and are in charge of medically qualified men and women who have made a special study of laboratory diagnosis. I believe that there is no district in England, Wales, or Scotland in which the services of such a laboratory are not available to the general practitioner.

Dr. Crossley-Holland's second assumption is that laboratory diagnosis may properly be undertaken by persons not possessing a medical training. He points out with truth that pharmacists have acquaintance with the methods of the laboratory bench; to make from this the transition to the assumption that in virtue of this familiarity the pharmacist is fitted to play the part of laboratory diagnostician is a very perfect non sequitur. It implies an implicit faith in laboratory methods as such, held by few who practise them. Most workers in diagnostic laboratories have at one time or another been embarrassed by being regarded as the priests of a peculiar ju-ju which in return for a suitable offering of a piece of meat or a bottle of urine will make oracular utterance. The scientifically minded laboratory diagnostician recognises that the results of his investigations play a part, sometimes lesser, sometimes greater, but a part only, in building up the picture of the morbid process which constitutes diagnosis and determines treatment. To play his proper part it is essential that the laboratory diagnostician have wide acquaintance with the whole field of medicine and that he move freely therein. To aid in diagnosis he must have knowledge of what he proposes to diagnose; failing this he is but a blind guide.

So well is the importance of laboratory diagnosis now recognised that the University of London has lately established a Diploma in Clinical Pathology, which may serve as the hall-mark of those having particular knowledge of, and skill in, the methods of laboratory diagnosis; this diploma is obtainable only by medically qualified men and women having special experience of this class of work.

Many pharmacists have in the past proceeded to the study of medicine and have come to adorn the profession of their second choice. The same course is still open to pharmacists wishing to qualify themselves for a closer contact with medicine.

I am, Sir, yours faithfully,

S. C. DYKE,
Hon. Secretary, Association of Clinical Pathologists.

Wolverhampton, July 8th.

MEDICAL HERBALISTS

To the Editor of THE LANCET

SIR,—Members of Parliament receive every month a journal called "The Medical Herbalist," which is described as the organ of the "National Association of Medical Herbalists of Great Britain." A legal M.P. in a recent public speech declared that he read the "Medical Herbalist" regularly, and it is indeed in many respects funnier than Punch.

The National Association of Medical Herbalists (N.A.M.H. for short) appears to control the "College of Botanic Medicine" at 46, Bloomsbury-street, London (which is also the registered office of the journal), through a council which appoints an "education committee," of which four "principals" (none medically qualified) are named in the Medical Herbalist of July, 1935, as giving instruction in "anatomy and physiology, materia medica and therapeutics, pathology and physical diagnosis, diseases of women and children, chemistry," and there is a further system of postal tuition in these subjects, forming part of the course leading to the issue of "Qualifications" to practice. Inspection of the calendar reveals that the College grant two "qualifications," both of which are called, sometimes "degrees," sometimes "diplomas," the users of these titles being apparently unaware that there is any difference between them. The "right" to practise "botanic medicine" is obtained by passing an oral examination founded on a curriculum which occupies three sessions of three months each, concurrently with a postal tuition course. The curriculum includes 32 separate subjects, and it is stated that there is a course of 12 lectures in each subject. Besides the subjects named above as being the responsibility of the "principals," bacteriology, general medicine, general surgery, gynæcology and obstetrics, pediatrics, orthopædics, urology, dermatology, otorhino-laryngology, ophthalmology, radiology and electricity, venereal diseases and infectious diseases are named as part of the course. Upon passing the examinations in this curriculum at the end of the third term, the "degree of L.C.B.M." is awarded, and immediately after this examination another oral test on the subject matter of the postal tuition course is held, upon passing which the "degree of M.N.A.M.H." is given. The two together are called the "conjoint degree," qualifying for practice. The fee for the whole course is 25 guineas, payable in advance, and a further fee of 5 guineas is payable on

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(*Continued from opposite page*)

and 29 (4) from influenza. The figures in parentheses are those for London itself.

Birmingham reported 5 of the fatal cases of diphtheria, 4 of those from diarrhœa and enteritis, and 3 of those from measles. There were also 4 deaths from diarrhœa and enteritis in Manchester, and 3 in Hull.

The number of stillbirths notified during the week was 258 (corresponding to a rate of 38 per 1000 total births), including 44 in London.

registration, whereupon the happy herbalist is "entitled to use the letters L.C.B.M. and M.N.A.M.H." after his name. After the lapse of a year the holder of the "conjoint degree" may be awarded the "higher degree of D.B.M. (Doctor of Botanic Medicine)," on presentation of a thesis of not less than 5,000 words, and the payment of a fee of 25 guineas.

In the Medical Herbalist of February, 1935, the announcement was made that, relying upon a "Royal Charter" given to Herbalists in the reign of Henry VIII (34 and 35, Henry VIII, c. 8), which it was stated is still upon the Statute Book, the Council of the N.A.M.H. have resolved henceforth to give the degree of "M.D." replacing the previous "D.B.M." It is only fair to say that in the March number of the Medical Herbalist a protest was made by a correspondent who pointed out "the risk of prosecution" because of this "imitation" of medical degrees, but no notice apparently was taken of this protest.

There are only two authorities in London who have legal sanction to confer degrees in medicine, the Archbishop of Canterbury (this privilege is now obsolete) and the University of London. Upon the publication of the resolution cited above I consulted the Vice-Chancellor of London University and ascertained that, although the claim to which I drew his attention was obviously absurd, the University could not take action to prevent the imitation of its titles. If and when, however, any person actually uses the title of M.D. on the authority of the "degree" given by the "College of Botanic Medicine" it is probable that a prosecution could be undertaken—e.g., by the Medical Defence Union, for infringement of the Medical Acts.

The history of the statute thus exploited by the N.A.M.H. is interesting. It has never been repealed, but as the statute made no provision (and no provision exists) prescribing who shall exercise the privileges named in the statute it has remained essentially inoperative.

The first attempt to regulate medical practice in in England was made by the Act 3, Henry VIII, by which no person was allowed to practice as a physician or surgeon within the City of London or a radius of seven miles from it without examination or approval by the Bishop of London, outside that area by the Bishop of the diocese concerned. That statute has never been repealed, but is superseded by later legislation. The Act 34 and 35, Henry VIII, was apparently passed to allow certain persons "to minister medicines" without having the licence from the Bishops provided for by the earlier statute. Judicial interpretations of 34 and 35, Henry VIII, provide limitations severely restricting its scope. Thus it has been laid down that its effect is that it "does not extend either in words or intent or meaning to give liberty to any person to practise or exercise for gain or profit." The parties licensed by that statute are "such persons as shall be good honest people, as old women and such as are inclined to give their neighbours physic through charity and piety," and the diseases in which "potions" are thus admissible were limited to three: "stone, strangury and ague."

These limitations are of course not indicated in the claim put forward by the Council of the N.A.M.H. that the Act 34 and 35, Henry VIII, legalises the indiscriminate practice of herbal medicine in this country. How dangerous that practice has become may be gauged by the Coroner's inquests in which herbalists have been concerned.

I am, Sir, yours faithfully,

House of Commons, July 8th. E. GRAHAM LITTLE.

AGGLUTINATION OF VIRUS BODIES

To the Editor of THE LANCET

SIR,—Prof. J. G. Ledingham's letter in your last issue makes it clear that he himself in his paper in 1931 recognised the priority of Paschen in the matter of the agglutination of the elementary bodies of vaccinia by specific serum. Had he pursued his researches more meticulously and written to our common friend Prof. Paschen for further details he would have found that Paschen's first observation was actually made in 1911, two years before the published paper to which Prof. Ledingham refers. The expression therefore "not very profound or critical" that Prof. Ledingham is kind enough to apply to my references applies even more appropriately in this instance to his own.

The real point at issue between Prof. Ledingham and myself is the question as to the relative merits of the macroscopic and microscopic methods of detecting the specific flocculation of a virus. Now, Sir, the first observation of the specific flocculation of vaccinia virus was made neither by Paschen nor by Ledingham, but by Tanaka in Japan as long ago as 1902, and curiously enough Paschen himself in his paper in the *Deutsch. med. Woch.* of 1913 referred to by Prof. Ledingham seems to have missed this paper, which was published in the *Centralblatt f. Bakteriol.*, Abt. 1, 1902, Orig., xxxii., 726. The following notice of this observation is taken from my special report "Studies of the Viruses of Vaccinia and Variola" (M.R.C. Special Reports No. 98, 1925, p. 15).

> "The first observation that a suspension of vaccine lymph undergoes flocculation when brought in contact with immune serum was published in 1902 by Tanaka, who in the course of an epidemic of small-pox in Japan found that fluid from a serous effusion in a small-pox patient when left in contact with a suspension of vaccine lymph for several days at 37° C. produced a coagulation phenomenon akin to the Pfeiffer-Gruber-Widal reaction. Control observations with normal serum, and hydrocele and ascites fluids when mixed with vaccine lymph in the same way, proved negative. This observation was confirmed in 1904 by Freyer (*Centralbl. f. Bakteriol.*, Abt. 1, 1904, Orig., xxxvi., 272), who found that the serum of a well-immunised calf or rabbit as well as that of a vaccinated man produced flocculation of a suspension of calf lymph."

It was this observation of Freyer that Paschen refers to as preceding his own in the paper published in 1913. The occurrence of the flocculation reaction in question, however, was contradicted by v. Pirquet in a paper published in the *Wien. klin. Woch.*, 1906, xix., 1407, and his prestige and authority were so great that further progress in the practical application of the reaction for recognising cases of small-pox was delayed until publication in 1925 of the M.R.C. Report referred to above and the later work of Burgess, Tulloch, and Craigie. As stated before, the flocculation was shown by Craigie to depend upon two factors; an agglutination of the E.Bs, and a precipitation of their soluble products.

With regard to the microscopical procedure employed, first by Paschen and eighteen to twenty years later by Ledingham, in which the elementary bodies were shown to be agglutinated, while the method has undoubtedly the merit that the purified virus agent can be observed, as Ledingham and Eagles were the first definitely to prove, the procedure is by no means free of criticism. First of all, as Paschen pointed out, it is liable to be complicated by the simultaneous presence of a precipitin reaction; secondly, it involves the use of that museum-piece the hanging drop chamber; and thirdly it means a long and tedious wait of 48 hours or even longer during which the hanging drop may dry up, or in warm weather such as we have recently been experiencing moulds, &c., may get in. The whole tendency in the application of specific serological methods of diagnosis in practical medicine to-day consists in the employment of macroscopic methods, which save both time and labour, and have the further conspicuous merit that the absorption test can be used as well to check results. Moreover, the microscopic agglutination of elementary bodies is at present badly in need of further control observations.

I am, Sir, yours faithfully,

M. H. GORDON.

St. Bartholomew's Hospital, E.C., July 7th.

STERILITY AND PSYCHONEUROSES FOLLOWING LUMBAR SYMPATHECTOMY

To the Editor of THE LANCET

SIR,—My attention has been drawn by Dr. Levy Simpson to the erroneous conclusions which might be drawn from my paper on this subject which you published on April 6th. Investigations into the after-results of some hundreds of operations performed at the Mayo Clinic and by Prof. J. R. Learmonth and Prof. E. D. Telford have shown that lumbar sympathectomy or ganglionectomy, unilateral or bilateral, is never followed by any sexual difficulty. On the other hand, Prof. Learmonth tells me that in his experience presacral and inferior mesenteric neurectomy in the male is invariably followed by loss of ejaculatory power and consequent sterility, though not by impotence; the fibres concerned in this loss traverse the presacral nerve. Presumably the latter operation was performed in the two cases referred to in my paper.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, July 5th.

CLEFT PALATE

To the Editor of THE LANCET

SIR,—I think I can best answer Mr. Wardill's letter by quoting two passages from his own pen. In his letter in your last issue he writes: "The whole object of the procedures advocated by myself has been that of restoration of function, and this can only be attained by operation based on sound anatomical and physiological principles. The proof of success lies not in the appearance of the suture line or in the apparent mobility of the palate, but in the ability of the patient to open and close the nasopharyngeal valve." Yet his paper in the *British Journal of Surgery* (October, 1933) contains the following sentences: "Among my greatest disillusionments in cleft-palate surgery was the case of a young woman . . . upon whom the operation of pharyngoplasty with repair of the palate was performed. The operation resulted in a perfect palatopharyngeal mechanism which complied with all the tests, and for many weeks I spent much time in correcting her bad habits, until in the end she was sound perfect. At this time she was engaged to be married, and, marriage ultimately taking place, I did not see her till some months after, when happening to meet her in the street, I was amazed to find that she had become one of the worst cleft-palate speakers I had ever heard."

It has been stated many times that a patient regarded as a surgical success is a functional failure, and even Mr. Wardill admits this. The converse is also true. Surely, then, some form of speech training is essential. There are many recorded cases of a functionally perfect result following such training "in spite of" surgery.

Having read much of the extensive literature that has grown up around the surgery of cleft palate, and having tried several means of closure of the cleft, I now use Veau's technique which I have modified slightly. Veau's operations are described in detail in his book, which however is written in French. I have published an (admittedly inadequate) account of Veau's technique taken from this source in THE LANCET (1933, i., 515). I am, Sir, yours faithfully,

DAVID LEVI.

Harley-street, W., July 6th.

GOLD TREATMENT OF TUBERCULOSIS

To the Editor of THE LANCET

SIR,—Your last issue contains the results of a statistical inquiry into the results of gold therapy in pulmonary tuberculosis by Dr. B. A. Peters and Dr. C. Short of Bristol. So sweeping is the generalisation inherent in their conclusions, and so great its clinical significance if it is correct, that it warrants a close examination of the evidence upon which it is founded.

In the first paragraph of their paper Drs. Peters and Short say, in regard to the assessment of the therapeutic value of any particular agent in pulmonary tuberculosis, "If any method of selection is used an imponderable error is introduced." Later they state that "during the past three years those not treated with gold have been slight cases or cases with pleural effusion . . . or moribund cases." Thus, by their own admission they must have employed *some* selection, thereby introducing an "imponderable error"! That this selection was capable of introducing a very significant "error of sampling" is shown by a scrutiny of Table III.: in the 1930–34 experience, only 171 out of a total of 492 (35 per cent.), and in the 1932–34 experience, 147 out of 299 cases (49 per cent.), were treated by gold: further, a simple subtraction sum shows that in the years 1930–31 only 24 of 193 cases (13 per cent.) received gold.

With the statement "during the past three years those not treated with gold have been slight cases or cases with pleural effusion in whom the prognosis was very favourable without special treatment, or moribund cases," let us couple "the tuberculosis officer who is responsible for allocating cases to our institution informs us that the cases sent to us have been chosen on the same basis during the whole ten years—another institution receiving the majority of the earlier cases." It follows that the above-mentioned "slight cases or cases with pleural effusion" form a relatively insignificant fraction of the cases untreated by gold—i.e., 65 per cent. in the first and 51 per cent. in the second observation period. This conclusion surely stultifies the major premise of the theorem that "an improvement in the results of a five years' working should be evident if gold were of any value," because the gross preponderance of "moribund" cases in the total experience can only falsify the statistical issue.

When one seeks to determine exactly *what* type of case was treated with gold, the only answer appears to be that they were neither very early cases nor moribund ones: between these two extremes lies a host of possible permutations and combinations of clinico-pathological variables, and the criteria upon which the authors decided to exhibit gold in any given case remain shrouded in obscurity. In particular, no mention is made of radiological examination which so often compels the assessment as an advanced case of what clinically is a mild or moderately severe one. So again, by a lack of clarity in description of their material, the authors expose themselves to a possible statistical error.

The assessment of the value of a therapeutic method, whether statistically or otherwise, necessarily connotes that the method has been employed in accordance with the canons of its correct usage as laid down by past and current clinical and experimental research. Contemporary opinion in regard to gold therapy for pulmonary tuberculosis has it that at least 5 g. in all should be administered, and, for certain experimentally established facts, by the intravenous route. Drs. Peters and Short say their cases ". . . have had gold in the form of Crysalbine, Allochrysine, or Myocrysine in the usual weekly doses of 0·1–0·5 g. for six to eight weeks, followed in many by a repeat course after an interval of six weeks." Thus it seems that the efficiency of gold therapy in their hands can be indicted upon the grounds that the preparations used by them were administered by the *intramuscular* route, and more, that the total dosage was an inadequate one; for we are not told exactly how many cases had a "repeat" course.

To summarise:—The sweeping generalisation, sorrowfully made by Drs. Peter and Short, that gold in the therapy of pulmonary tuberculosis is quite valueless, has for its foundations very important errors of sampling, a lack of definition of selective criteria, and a misuse of the therapeutic agent. Their conclusion contrasts strangely with that of a carefully controlled statistical study such as Stub-Christensen's (Tubercle, 1931, xiii., 49).

I am, Sir, yours faithfully,

Queen Anne-street, W., July 8th. CEDRIC SHAW.

DUODENAL EXTRACT IN DIABETES MELLITUS

To the Editor of THE LANCET

SIR,—Your annotation of July 6th under this title omits reference to a paper by my old chief, Prof. J. Hill Abram, in THE LANCET (1906, i., 220) on "The Acid Extract of the Duodenal Mucous Membrane as a remedy in Diabetes Mellitus." He dealt fully with the problem in this and two subsequent papers published in 1906 in the *Biochemical Journal* in collaboration with Prof. Benjamin Moore (who first suggested the use of duodenal mucosa) and E. S. Edie. Their reasoning was:—

> "If, for the purpose of argument, we take it that the duodenum does yield a chemical excitant for the internal secretion of the pancreas, and that in the absence of the internal secretion glycosuria results, then there are three places in the chain at which weakness due to functional or other disarrangement may occur and lead to a breakdown and the appearance of diabetic conditions. First, the breakdown may occur at the duodenum, on account of the non-secretion of the excitant; secondly, the breakdown may take place at the pancreas, so that although the excitant is formed at the duodenum and carried to the pancreas, yet these cells are not capable of excitation, either from complete morbid change or from some functional alteration in their metabolism; and thirdly, there is the possibility that even when the duodenum is normal and supplying its excitant, and although the pancreas is also normal and yielding, as a result of the action of the excitant, its internal secretion, yet there are changes in the oxidising tissues such as the liver or muscles which prevent the oxidising function of these from coming into operation.
>
> "It is clear that it is only in the first class of case that benefit might be expected to follow in a diabetic from administration of extracts of duodenum, even granting that the experimental difficulties of administration had been so overcome that the active material entered the circulation and reached the pancreas as if it had naturally been formed in the patient's duodenum.
>
> "Accordingly, it is scarcely to be expected that in all cases administration of extracts of duodenal mucous membrane will cure, or even benefit, diabetics, and to prove the existence of a specific chemical excitant for the internal secretion of the pancreas formed in the duodenum, it is only necessary to show in a fair percentage of cases that abolition of glycosuria follows administration of the extract of duodenal mucous membrane."

It is interesting to compare the first paragraph of the above with the following summarising paragraph in the paper which, thirty years later, is dealt with in your annotation:—

"The results suggest that three types of diabetes exist—e.g., (1) from lack of activation of the pancreatic islands by a duodenal factor, (2) from loss of Islands of Langerhans, and (3) an insensitiveness of the organism to insulin." (Duncan, Shumway, Williams, Fetter: Amer. Jour. Med. Science, March, 1935, p. 418).

I am, Sir, yours faithfully,

Liverpool, July 9th. HENRY COHEN.

SODIUM AND THE SUPRARENALS

To the Editor of THE LANCET

SIR,—The annotation on this subject in your last issue refers to a conclusion of Loeb and his colleagues that if adrenal insufficiency in man is not relieved by the administration of salt it will not be relieved by commercial cortical extracts in ordinary doses. This is contrary to my clinical experience and its acceptance would, I believe, cause unnecessary suffering. For the latter reason I write this brief note, although it is not my intention at the moment to discuss the therapeutic value and limitations of salt or sodium therapy.

I am, Sir, yours faithfully,

Harley-street, W., July 7th. S. LEVY SIMPSON.

IRISH MEDICAL ASSOCIATION.—The annual meeting of this association was held in Dublin on July 3rd. Dr. Robert J. Rowlette was re-elected president, and Dr. John P. Shanley was elected vice-president. The business of the meeting was divided into two sessions—one for scientific discussions and one for the ordinary business of the association. The scientific session was held in the forenoon, and there were two discussions—the first on immunisation against diphtheria, and the second on puerperal sepsis. The discussion on immunisation was opened by Dr. J. P. Shanley, and communications were also made by Dr. C. J. McSweeney, medical superintendent of Cork Street Fever Hospital, Dublin, and by Dr. J. C. Saunders, medical officer of health for the city of Cork. The discussion on puerperal sepsis was opened by Dr. Bethel Solomons, and communications by Dr. Gibbon FitzGibbon, Dr. N. McI. Falkiner, and Dr. John McGrath were read. Both discussions were highly practical and were greatly appreciated by the members present. In the evening the members of the association and their guests dined together at the Dolphin Hotel. Among the principal guests were the Lord Mayor of Dublin, the Attorney-General of the Irish Free State, the president of the Royal College of Physicians of Ireland, the president of the Royal College of Surgeons in Ireland, and the governor of the Apothecaries' Hall.

Arrangements made for amalgamation with the British Medical Association's Irish branches are described on p. 90.

OBITUARY

THOMAS McCRAE, M.D., D.Sc. Toronto, F.R.C.P. Lond.

PROFESSOR OF MEDICINE, JEFFERSON MEDICAL COLLEGE, PHILADELPHIA

AFTER an illness lasting more than a year death released Thomas McCrae from increasing disability in spite of which he had courageously carried on his teaching. Coming of an old Galloway fighting stock he was born on Dec. 16th, 1870, at Guelph, Ontario, as the eldest son of Lieut.-Col. David McCrae and his wife Janet Eckford. His brother John was the pathologist, physician, and poet who wrote "In Flanders Fields" and died on active service in January, 1918, a few days after he had been appointed consultant physician to the Imperial Forces overseas. The two brothers were educated medically at Toronto University and went as post-graduates to work under Osler at the Johns Hopkins Hospital. After this their careers diverged; John returned to Canada and at McGill University taught first pathology with J. G. Adami and later clinical medicine. Thomas remained at the Johns Hopkins Hospital and as resident, instructor in medicine and in charge of the clinical laboratory, resident physician, and associate professor of medicine became a most successful clinical teacher. Like W. S. Thayer he was very closely associated with Osler, his chief, often travelling with him and helping and collaborating in medical publications; for example in "Cancer of the Stomach: A Clinical Study" (1900), in "Modern Medicine" (1907) which was a system of medicine (at first in seven, later in six volumes) running into a second and third edition (1913, 1925), and in the later editions of Osler's well-known text-book.

Often in this country in the summer with his chief, before the latter came to Oxford as Regius professor of medicine, and later with Mrs. McCrae, he became M.R.C.P. in 1901 and was elected F.R.C.P. in 1907. As a bachelor he lived for some years in the same house in Baltimore as W. H. Welch; in 1908 he married Amy Gwyn, a niece of Sir William Osler, and in 1912 he left Baltimore to become professor of medicine at the Jefferson Medical College, Philadelphia, in succession to Prof. J. C. Wilson who survives him. During the European war he was for a time Lieut.-Colonel C.A.M.C. and head of the medical service of a Canadian War General Hospital. Well known on both sides of the Atlantic for his writings and with many personal friends he took an active part in American medicine, being secretary (1917–26) and president (1930) of the Association of American Physicians which corresponds to the later established Association of Physicians of Great Britain and Ireland, of which he was, with Lewellys Barker, elected a foreign honorary member last year. At the Royal College of Physicians of London he gave the Lumleian lectures in 1924, taking as his subject the clinical features of foreign bodies in the bronchi (THE LANCET, 1924, i., 735, 787, 838), on which his experience with his colleague Chevalier Jackson made him an exceptional authority. In 1927 he received the honorary degree of D.Sc. from Toronto, his own University

With a fine presence McCrae radiated good nature and inspired immediate confidence. The sympathy of his numerous friends will go out to his childless widow.

HENRY JOHNSTONE CAMPBELL, M.D., F.R.C.P. Lond.

THE death occurred on July 4th, in Dartmouth Cottage Hospital, of Dr. H. J. Campbell, late consulting physician to the Bradford Royal Infirmary and professor of forensic medicine at the University of Leeds.

Henry Campbell, the third son of Peter Campbell of Brackley, was born in London in 1859 and educated at University College School, proceeding to Guy's Hospital for his medical education. He qualified with the English double diploma in 1887 and graduated as M.B. London in 1889 with first-class honours in forensic medicine. At Guy's Hospital he made a mark in the school, being senior demonstrator of physiology and lecturer on elementary biology in the school, while he was also a Hunterian professor of physiology at the Royal College of Surgeons of England. He was elected assistant physician to the East London Hospital for Children in 1891, and held the post for four years, during the last two of which he was also assistant physician to the City of London Hospital for Diseases of the Chest. In 1895 he went to Bradford on his election as physician to the Bradford Royal Infirmary and now became a prominent figure in the educational life of the Victoria University as lecturer in forensic medicine and toxicology at the Yorkshire College. He was elected F.R.C.P. Lond. in 1898, and on the institution of the University of Leeds was appointed professor of therapeutics and pharmacology in the university, while his other posts included those of consulting physician to the Victoria Hospital, Keighley, to the Bingley Hospital, and to the Bradford Eye and Ear Hospital. Dr. Campbell made important contributions to medical literature. Early in his career he wrote useful records in the Guy's Hospital Reports and a work on elementary biology. He edited the English translation of Hertwigs "Cell," and published clinical papers in the *Quarterly Journal of Medicine*, the *British Medical Journal*, and the *Edinburgh Medical Journal* over a large range of subjects.

During the war Dr. Campbell was physician to the Bradford War Hospital and at the conclusion of hostilities retired to Dartmouth. Here he took a great interest in municipal affairs, was elected to the Devon County Council, made J.P. for the county, and was mayor of Dartmouth for six years. He served on many important committees of the county council, was chairman of the Governors of Dartmouth Grammar School, and a member, generally as president, of many local bodies concerned in the maintenance of health and the promotion of sport.

FLORENCE STACEY-CLEMINSON, M.B., B.S. Lond., J.P.

THE death occurred on June 30th of Dr. Stacey-Cleminson, well known as a medical practitioner and public worker in Hull.

Florence Stacey, a New Zealander, studied medicine at the London School of Medicine for Women, and graduated as M.B., B.S. London in 1909. She held appointments at the Royal Free Hospital and in 1911 was appointed house surgeon to the Victoria Hospital for Children, Hull, and from that time forward spent her professional life in Hull. She soon gained a place on the honorary staff of the hospital, and practised in partnership with another doctor, Dr. Mary Charlotte Murdoch, at that time also on the staff of the Victoria Hospital. On the death of Miss Murdoch, Dr. Stacey married Mr. Cleminson and shortly afterwards discontinued private practice, though her services were often in request as a consultant. She now devoted herself to public work of which she had considerable experience as a prominent person in the organisation of the National Council for Women. She was appointed a justice of the peace and served on the panel of justices to the juvenile court where her special training made her services of particular value. She was a member of the health and public service committee of the Hull corporation and touched the social side of the city at many points, making her mark on the life of Hull.

GEORGE CHARLES PEACHEY, L.R.C.P., L.R.C.S. Edin.

THE death occurred on Sunday last, July 7th, of Dr. George Peachey who made a considerable mark as a medical journalist and historian. Peachey, who was descended from a long line of doctors, was born in Calcutta in 1862, the son of Thomas Peachey, I.C.S. He received his general education at Taunton school and proceeded thence to St. George's Hospital and the University of Edinburgh, where he qualified with the Scottish double diploma in 1887. At first in general practice in Berkshire, he held various appointments, among others that of medical officer and public vaccinator to the Wantage Union, but his inclinations led him to return to London and take up literary work in connexion with medicine. He contributed to various magazines biographical sketches of famous men of science, was the author of a short life of Sir William Savory, and he undertook the writing of the history of St. George's Hospital with the support of Clinton Dent, then senior surgeon to the hospital. After Dent's death the work was not completed in accordance with the original design. He was a British delegate to various historical congresses in Rome and Budapest, and was for a long time associated with the conduct of the *Medical Press and Circular* where much of his historical or antiquarian writing appeared. He was a member of the Society of Genealogists, for pedigree rather than heredity interested him; and he was British delegate on more than one occasion at historical congresses. The direction of his work led him to become familiar with the developments of medical organisation over a long if modern period, and he described the origin of voluntary hospitals as we now understand them in the *Hospital*. In 1928 Peachey delivered the Thomas Vicary Lecture at the Royal College of Surgeons of England. The lecture entitled "The Homes of the Hunters" was published in THE LANCET (THE LANCET, Feb. 18th, 1928, p. 360), and was as much concerned with William Hunter as with his better known brother, John. With its full illustrations and sound reflections on the careers of the famous brothers the essay revealed Peachey as a man of real literary talent.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Overcrowding in Scotland

IN the House of Commons on July 3rd Mr. SKELTON, Under-Secretary of State for Scotland, moved the third reading of the Housing (Scotland) Bill. He said that overcrowding in Scotland was a serious danger and difficulty. The powers and the finance which this Bill gave to the local authorities armed them satisfactorily to deal with the problem as it had never been dealt with before. The Bill would achieve a double result: low wage earners, or those with limited financial means, would be given an opportunity of being rehoused at rents which they could afford to pay; and that those whose means would enable them to take houses at an economic rent would not be subsidised by their fellow citizens. The provisions even with regard to those areas would ensure that the central sites of the bigger cities were used and not allowed to degenerate. One cause of misunderstanding in regard to the Bill was removed by the undertaking given by the Secretary of State for Scotland on the second reading and the alteration made in Committee to deal with the fears of those who thought that the object of one of the clauses was to force the owners of existing property to adopt forthwith a new standard. Another misunderstanding was that the Bill would result in the indiscriminate slaughter of existing housing accommodation. Where a survey showed that existing houses were suitable for replacement for occupational purposes this fact would be borne in mind in relation to the housing programme. There was a superfluity in Scotland of one- and two-roomed houses, the former unsuitable for a family, though the two-roomed house might well be suitable to a newly married couple, and even a couple with one child. But many two-roomed houses in Scotland dated back to the middle years of the nineteenth century, built in vast rookeries with lighting, air space and passage space entirely out of date. Some of these would undoubtedly go. There were, however, two-roomed houses built shortly before the war with proper modern amenities, and he did not believe that these ran any risk.

Mr. N. MACLEAN said that they needed a completely new set of circumstances, and the sooner they got them the better for the health of the people of Scotland. It was not merely an overcrowding question but a health question, and he wanted to see the features embodied in this Bill extended in a more generous manner, the machinery simplified, and the methods to be adopted by the local authorities handled in a different way. The Government departments should see to it that the local authorities attended to their duties under the housing legislation; some had been remiss in the past. The Labour Party hoped that there would be, in this Bill or in a later measure, additional powers given to the department to sweep out of existence the great curses of single apartment and room and kitchen houses that had been so much to the detriment of the health of the people of Scotland.

Sir ARCHIBALD SINCLAIR supported the Bill on behalf of the Liberal Party.

Sir IAN MACPHERSON said that the problem of overcrowding did not exist in the same way in the rural districts as it did in the towns. The problem in the rural areas was not so much overcrowding as the habitability of the houses. What they wanted in the Highlands was a small subsidy to recondition houses. In some of the burghs of the North of Scotland they could find individual houses as bad as any of the slums in the great cities.

After further debate,

The Bill was read the third time and passed.

Prison Administration in Scotland: Medical Officers' Duties

The House of Commons on July 4th went into Committee of Supply on the Civil Estimates.

On a vote for salaries and expenses of the Prisons Department in Scotland,

Sir G. COLLINS, Secretary of State for Scotland, said that his attention had been drawn to the inspection of bedding in prisons. All the regulations were to be completely reviewed in the light of modern thought and modern outlook. The Department were securing a site near Carstairs for a modern criminal lunatic building and when that building was erected there would be a big transfer of criminal lunatics from Perth Prison to Carstairs.

Mr. N. MACLEAN said in the Report of the Prisons Department they found that certain prisoners were certified under the Mental Deficiency and Lunacy (Scotland) Act, 1913, during 1934. The number included quite a number of youths as well as men. There was one case in which he was interested of a lad of 17 years of age who was sentenced in April, 1934, to 60 days' imprisonment and was transferred to Stoneyetts Certified Institution on May 17th in terms of an order by the Secretary of State under Section 10 of the Act to which he had referred. This lad might perhaps lack intelligence, but he was by no means mentally defective. He was treated in one of the special schools in Glasgow. To the best of his (Mr. Maclean's) knowledge the lad was still at Stoneyetts Certified Institution. He had tried to get this lad released but had failed to do so. He had several cases which bore some resemblance to this case, and he entertained grave feelings about what was likely to happen if the Secretary of State obtained the further powers for which he was asking in the Criminal Lunatic Bill.

Mr. LEONARD said that prisoners on their reception into prison had to wait in a detention cell for a medical examination and that the period between their reception and the medical examination was sometimes an hour or two hours, and that the conditions under which the prisoner was in that cell were anything but comfortable. He also wished to raise the question of the medical inspection of prisoners. He had received from the Secretary of State in reply to a question a list of the duties of medical officers and Rule 225 (8) stated:

> "A medical officer shall see every prisoner at least once a week, so as to ascertain his general state of health, physical and mental, and whether he is clean in his person and free from disease, and if his clothing and bedding are sufficient, and shall record the results of his inspection in the journal."

That rule was quite explicit, easily understood and commendable, but he was informed that these things could not be done by any medical officer if the practice that held good in Barlinnie Prison was adopted in prisons elsewhere. He was informed that this weekly inspection was somewhat in the nature of a single-file parade past the medical officer and if that was the case it was totally inadequate and no medical officer irrespective of his ability was capable of attending to the details in the rule by such a cursory survey of the people under his charge.

After further debate,

Sir G. COLLINS, Secretary of State for Scotland, said that the points Mr. Leonard had raised would be examined. The practical administration of Barlinnie and other prisons would be scrutinised. In regard to the case referred to by Mr. Maclean it was undoubtedly true, and he (Sir G. Collins) regretted it, that intimation of the removal of this young lad was not sent to the relatives by the prison governor, and steps had been taken to see that such a thing would never occur again. During the last few months he had made thorough inquiries to see whether the lad could be released, but his present information was that it would not be in his interests to release him. He would, however, consult an outside doctor untrammelled by departmental influence in the matter.

Mr. MACLEAN said this case had been mismanaged from the commencement by the authorities. Might he ask that the medical man or men whom the right hon. gentleman intended to ask to examine this case should do so away from the environment of Stoneyetts Certified Institution; that they should be asked to certify the lad free from the surroundings of a lunatic asylum?

Sir G. COLLINS: I will have inquiries made, but I must not be taken as agreeing that the inquiry shall be outside a particular place.

Mr. MACLEAN: Will it not be prejudiced if the examination is made in the mental institution?

Sir G. COLLINS: Everything will be done above board to inquire whether this youth should be retained where he is.

After further discussion the debate on the vote was adjourned.

In the House of Commons on Monday, July 8th, the University of Durham Bill, which has already passed through the House of Lords, was read a second time. The money resolution in connexion with the Bill was agreed to in Committee.

The money resolution in connexion with the Criminal Lunatics (Scotland) Bill was also agreed to in Committee.

National Health Insurance Bill

In the House of Commons on July 8th the National Health Insurance and Contributory Pensions Bill was considered in Committee.

Mr. TINKER moved to omit the provision in paragraph (4) of Clause I. that a person should not be entitled to maternity benefit during an extended insurance period unless and until, having again become employed within the meaning of the Bill, he had been so employed for at least 26 contributory weeks in a period of not more than four consecutive contributory half years and had paid 26 contributions. The cash benefit in maternity cases was especially important, because it was required at the time when there was most need in the house.

Sir KINGSLEY WOOD (Minister of Health) said that in addition to the provisions of maternity benefit under the National Health Insurance Act local authorities provided facilities in their hospitals and homes in connexion with schemes of maternity and child welfare. Most women who took advantage of those facilities made payment for them. It was difficult to extend the cash payment in respect of maternity without so extending sickness and disablement benefit for men as well as women. Unless the financial scheme of the Bill were wholly recast it would not be possible for such payments to be made. He had no doubt that a number of the approved societies would not be able to make the payments.

After further debate,

Sir KINGSLEY WOOD said that he would, however, look into the matter again.

The amendment was withdrawn.

Mr. RHYS DAVIES moved the following new Clause: "Every assignment of or charge on, and every agreement to assign or charge, any remuneration payable to a medical practitioner in respect of the administration of medical benefit shall be void, and, on the the bankruptcy of any medical practitioner entitled to such remuneration, the remuneration shall not pass to any trustee or other person acting on behalf of his creditors." The purpose of the new Clause was to expose some anomalies which had crept into panel practices in some parts of the country. The position, briefly, was this: A medical student, when qualified, might be poor when starting his career. To buy a practice he must have money. He believed that in some cases the young doctor got so involved in the hands of money-lenders that the fact led to his practice suffering. He believed that within the medical profession arrangements existed whereby young doctors were helped in starting their careers, but he was not referring to that angle of the case. The position was stated in a definite and official form in the Report of the Annual Conference of the Association of Insurance Committees. He was not criticising the young doctor who borrowed money, but he wanted to lay it down definitely that money should not be lent under such conditions for its repayment as would harass the doctor to the detriment of his private or panel practice. It was not suggested that such cases were common.

Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) said that there was no evidence, except in an infinitesimal number of cases, that the efficiency of the panel practitioner was being affected by the fact that he used the security of his practice to advance himself in his career. It would be putting too great a disability on a young panel practitioner to prevent him from doing this. The real safeguard was that it was a matter for the British Medical Association to see that the panel practitioner was not made the prey of unscrupulous people. More and more reputable insurance societies were making provision to enable practitioners to borrow on reasonable terms. The Ministry would watch the position in consultation with the British Medical Association to see that the panel practitioner was not disadvantaged by mortgaging his security.

The new Clause was withdrawn.

The Bill passed through Committee and was reported to the House.

HOUSE OF COMMONS

MONDAY, JULY 8th

Destruction of Locusts and Malarial Mosquitoes

Mr. McEntee asked the Secretary of State for the Colonies whether any experiments by spraying from the air for the destruction of locusts or malarial mosquitoes had been carried out in any area controlled by his department; and, if so, were the experiments considered to be successful.—Mr. Malcolm MacDonald replied: Certain experiments against locusts were carried out last year by the Government of Northern Rhodesia. These showed that it is possible to destroy locusts in flights by spraying them with finely divided poison dust from aircraft. The report on these investigations was considered by the Third International Locust Conference, in September last, which recommended that further work should be carried out with a view to developing these methods of locust control. I am not aware of any experiments in the destruction of malarial mosquitoes by similar methods in any of the Dependencies.

WEDNESDAY, JULY 3RD

Maternal Mortality in Ceylon

Mr. Thomas Williams asked the Secretary of State for the Colonies what was the maternal mortality-rate in Ceylon for the latest year for which figures were available; and how many deaths were involved.—Mr. Malcolm MacDonald replied: The maternal mortality rate in Ceylon for 1933 was 18·6 per 1000. The number of maternal deaths involved was 3832.

Mr. Williams: Is the right hon. gentleman aware that this constitutes the highest maternal mortality figure of any civilised country in the world, and can he say what steps the Government are taking to deal with the matter?

Mr. MacDonald: The figures represent a considerable decrease on what they have been, and in recent years there has been a steady improvement. The Government are taking various steps to meet the situation.

Mr. Williams: Is the right hon. gentleman not aware that the 18 per 1000 births compares very badly with the 4 per 1000 births in this country, and that there is very real room for improvement?

Mr. MacDonald: The fact that there has been a steady improvement in recent years shows that we are aware of the problem and that we are doing everything we can to solve it.

Unemployment Regulations and Meals for School-children

Mr. Cleary asked the Minister of Labour whether he was aware that in the city of Liverpool the Unemployment Assistance Board was making deductions in respect of meals given to necessitous school-children; and, if he could say under what regulation of the Board this was done, and whether he would have this practice stopped, in view of the fact that the Board of Education, by making grants towards the cost, was encouraging the granting of such meals, particularly in industrial areas, in order to enable children to benefit from the education afforded in the schools.—Lt.-Col. Muirhead, Parliamentary Secretary to the Ministry of Labour, replied: I am informed that the Board's practice in the treatment of school meals is as set out in the Appendix to the Memorandum on the Unemployment Assistance Regulations 1934, presented to Parliament in January last (Cmd. 4791). As indicated there, the Board entirely ignores all meals given upon a doctor's certificate that a child is suffering from a specific pathological condition and also all those consisting of milk and other special forms of provision. Moreover, other meals are only taken into account where they exceed twelve a week, and the adjustment made in the allowance is based on a moderate estimate of the saving to the household, approximately one penny per meal. The Board inform me that they are keeping a close watch on the working of these arrangements.

Mr. Cleary: Will the meals in question granted to the necessitous school-children come under the exemptions mentioned by the hon. gentleman in his reply?

Lt.-Col. Muirhead: I cannot answer that question without notice.

Mr. Cleary: Is it within the knowledge of the hon. gentleman that deductions of the character mentioned are being made in Liverpool?

Lieut.-Col. Muirhead: I understand that that is so. It is being done in accordance with the instructions issued last January.

Mr. Cleary: In view of the fact, that the Board of Education make a grant of 50 per cent. towards the cost of these meals, and by recent circular are endeavouring to encourage very definitely their provision in industrial areas, is the hon. gentleman aware that the action of the Unemployment Assistance Board is militating against the policy of the Board of Education?

Lieut.-Col. Muirhead: I can only say that the Board are acting under the powers granted to them by this House.

Mr. G. Griffiths: If the public assistance committee give these meals without taking them into account what authority have these other people to take them into account, because there is a standstill order?

No answer was given.

Local Authorities without Superannuation Schemes

Mr. Tom Smith asked the Minister of Health, the number of the local authorities that had not put superannuation schemes into operation.—Sir Kingsley Wood replied: The authorities who have not adopted the Act of 1922, or who have no schemes under local Acts are (apart from Parish Councils and a number of miscellaneous authorities) County Councils, 12; County Borough Councils, 16; Borough Councils, 132; Metropolitan Borough Councils, 2; Urban District Councils, 349; and Rural District Councils, 251.

State Grants for Medical Research

Captain Fuller asked the Minister of Health, what bodies or persons were receiving grants for medical research from public funds; and whether any notable results had been obtained in the last 10 years.—Mr. Duff Cooper, Financial Secretary to the Treasury replied: As regards the first part of the questions, I would refer my hon. friend to an answer which I gave on July 9th last. The provision for a grant to the Medical Research Council in the current year is £165,000. As regards the second part of the question, I fear it is impossible within the limits of a Parliamentary reply to do justice to the advance of medical science in the last ten years and to the part which state-aided bodies and persons have taken in that advance. I can only refer him on the subject generally to the Annual Reports of the Medical Research Council.

Pregnant Woman and Prison Sentence

Mr. McGovern asked the Secretary of State for Scotland, whether he was prepared to release Mrs. Kelly who was an expectant mother and due to give birth to a child in 5 weeks' time and was sentenced to six months' imprisonment for alleged perjury in the Garngad Rioting Case.—Sir Godfrey Collins replied: A medical report which I have obtained and examined shows that Mrs. Kelly's confinement is not expected until about the end of September and that she is well, in good general health and doing light work in the prison, and as stated in my reply to the hon. Member yesterday she will be removed to a hospital outside the prison for her confinement. The doctor will keep her under particular care and she will receive special medical attention. In no case can I find that pregnancy by itself has been regarded as a reason for release from prison. Having given further consideration to this case I regret that I can find no special circumstances which would justify me in recommending the release of Mrs. Kelly from prison at the present time.

Meals for Necessitous Unemployed Juveniles

Mr. TINKER asked the Minister of Labour, if he had considered the resolution passed by the Association of Education Committees calling upon the Government to introduce legislation to enable local education authorities, if they so desired to provide mid-day meals for necessitous unemployed juveniles attending approved full-time courses of instruction, and empowering the Ministry of Labour to bear the whole or part of the cost of providing such meals; and what reply he intended to give.—Mr. E. BROWN replied: I am not satisfied that a case has been made out for introducing the legislation necessary to enable local education authorities to provide meals at junior instruction centres, but I can assure the hon. member that the position is being, and will continue to be carefully watched.

Mr. TINKER: Will the right hon. gentleman make inquiries in the various localities and ask the authorities to send him cases in which it is felt that it is necessary that something should be done?

Mr. BROWN: That has been done. If the hon. member will consider the report of the National Advisory Council for Juvenile Employment in England and Wales, which is composed of representatives of the Association of Education Authorities, the National Confederation of Employer's Organisations, the Trade Union Congress General Council, the teachers organisations and the juvenile advisory committees, he will find that that report dated Jan. 20th, 1934, unanimously recommended against this course.

Mr. TINKER said that as he was not satisfied with the reply he would call attention to this matter at the earliest opportunity.

TUESDAY, JULY 9TH

Puerperal Fever Serum in L.C.C. Hospitals

Mr. GROVES asked the Minister of Health whether serum for puerperal fever was used, or had been used, in the hospitals under the administration of the London County Council.—Sir KINGSLEY WOOD replied: I understand that serum for puerperal fever has been used in one of the hospitals referred to, but that its use has now been discontinued.

MEDICAL NEWS

Royal College of Surgeons of England

Election to the Council.—On July 4th three fellows were elected into the council to fill the vacancies caused by the retirement of Sir Cuthbert Wallace, Mr. Leonard Gamgee, and Mr. L. R. Braithwaite. The result of the poll was as follows:—

	Votes.	Plumpers.
Leonard Ralph Braithwaite (Leeds) ..	838	33
Sir Cuthbert Sidney Wallace (St. Thomas's)..	829	40
Seymour Gilbert Barling (Birmingham) ..	709	15
Ernest Cranmer Hughes (Guy's)	648	68

In all 1187 fellows voted, including 208 fellows resident out of Great Britain and Northern Ireland; in addition eight votes were found to be invalid. Sir Cuthbert Wallace, Mr. Braithwaite, and Mr. Barling are all elected for the full period of eight years.

University of London

At recent examinations the following candidates were successful:—

D.M.R.E.

F. M. Abeles, P. A. Flood, Daniel Hugo, E. G. Lynch, Mahendra Mani, Stanley Nowell, and T. C. Wasson.

At University College the Schafer prize in physiology has been awarded to Dr. D. H. K. Lee and the Bayliss-Starling scholarship in physiology to Mr. R. A. Gregory.

University of Manchester

At recent examinations the following were successful:—

M.D.

By Thesis.—B. R. Bramwell, J. A. K. Brown, Eli Davis, E. M. Greaves, M. C. G. Israels,* Florence V. Stephen-Lewis, C. F. White,* and D. J. Williams.†

* With commendation. † Gold medal.

By Examination.—K. H. Jackson.

CH.M.

Branch I.—H. T. Simmonds.

FINAL EXAMINATION FOR M.B. AND CH.B.

John Charnley, Eleanor B. Clarke, Mary A. C. Cowell, T. F. Davey, Samuel Franks, E. H. Heilpern, K. H. Higson, R. E. Hirson, L. L. Husdan, J. I. A. Jamieson, T. S. B. Kelly, W. E. Kershaw, A. F. Mackay, R. L. Parish, J. N. Parker, G. R. Rhodes, Leslie Margaret Ross, Cyril Royle, H. L. Settle, Dennis Shute, Clifford Tetlow, Roland Thornley, H. J. Wade (with distinction in medicine), and Margaret I. Williams.

Part I.—Forensic Medicine and Hygiene and Preventive Medicine.—S. G. Abelson, Beryl A. Barlow, Muriel J. Brayshay, J. C. Brundret, P. J. Burke, J. H. B. Cantley, Caroline J. Chalmers, Violet Cohen, D. L. Cooke, G. D. Dawson, Benjamin Flacks, Jacob Goldman, David Halpern, Alan Hargreaves, B. P. R. Hartley, J. A. Herd, Isaac Hesford, James Hilton, C. B. Holland, V. T. Lees, John Meynell, Evaleen N. A. Milligan, Eleanor M. Mills, E. J. Mitchell, W. S. Parker, Benjamin Portnoy, D. A. Richmond, A. L. Robertshaw, E. N. Rowlands, Aboudi Shashoua, R. M. Shaw, Nina Shtetinin, H. B. Slater, A. M. L. Smith, F. W. Smith, Nathan Taylor, D. J. Walker, and E. P. Whitaker.

University of Sheffield

At recent examinations the following candidates were successful:—

M.D.

D. L. Brown and Hyman Finklestone-Sayliss.

FINAL EXAMINATION FOR M.B., CH.B.

Part II.—Charles Axinn (with second-class honours); and J. C. Jolly and Ronald Scott.

University of Birmingham

At a congregation on July 6th the following degrees were conferred:—

M.D.—P. C. P. Cloake.

M.D. (State Medicine).—Alfred Elliott.

Ch.M.—F. A. d'Abreu.

M.B., Ch.B.—J. L. Collis (first-class honours); J. C. Bishop, J. T. Corbett, G. L. Gale, Leopold Goldman, R. G. Record, R. A. Shove, and A. G. M. Wilson (second-class honours); F. L. Bland, M. I. Cookson, A. L. Deacon, E. G. Dommen, V. J. Downie, C. C. Houghton, H. B. Hunt, W. H. G. Jones, T. B. Kenderdine, G. B. Miller, J. S. Price, W. S. Rees, A. E. Roberts, Harry Taff, and B. W. Walford.

University of Liverpool

At recent examinations the following candidates were successful:—

M.D.

J. L. Clegg, Elinor M. Gelling, R. G. Gornall, Mary F. Lacey, J. E. S. Lloyd, G. A. C. Lynch, J. Polonsky, Kathleen E. Slaney, and E. S. Smith.

FINAL EXAMINATION FOR M.B., CH.B.

Second Class Honours.—A. C. Brewer, B. J. Green, and W. Parke.

Part B. (1924 *Regulations*).—F. Harrison, J. R. Jones, and E. G. Watson.

Part III. (1929 *Regulations*).—Agnes Y. Bowie, J. L. Brown, G. V. Craine, H. R. G. Davies, V. K. Drennan, S. G. Griffin, R. L. Hartley, Clarice Hughes, J. E. E. Hughes, Mary M. Hurst, G. E. Jones, E. W. Knowles, H. S. Lanceley, Ethna W. Little, Sheelah Little, G. B. Marsden, A. G. H. Menzies, J. G. Rogers, and A. R. Sibbald.

Part I.—A. M. Abrahams, O. G. Bark, S. Bender, W. E. G. Bradford, K. W. Cameron, L. H. Chandler, E. Claitman, R. I. Cohen, K. W. Evans, J. G. Fox, J. Gendle, T. C. Gray, A. S. Hall, Elsie O. Hughes, H. Hughes, R. R. Hughes, T. S. Jones, J. Kay, J. Lawson, A. T. Leggate, M. Libman, H. K. Lucas, C. McGibbon, G. B. Manning, R. Marcus, E. H. Moore, W. J. Patton, W. H. G. Patton, R. S. Riley, W. A. M. Robinson, J. P. G. Rogerson, P. J. Rooney, A. C. Smerdon, A. R. Unsworth, J. Wajnerowicz, N. Waldman, S. R. Warren, T. E. Whitby, Evelyn M. Williams, G. E. O. Williams, Margaret E. Williams, R. B. Wright, and H. Zalin.

Part II.—L. V. Arundel, S. Ball, O. G. Bark, D. Barton, A. B. Bateman, A. H. Baxter, J. C. Birchall, J. G. Bozle, P. S. Byrne, H. Cantor, Eileen Chrimes, Eunice M. Clapham, S. E. Cooke, F. W. Crook, J. B. David, R. E. A. Davies, F. C. Deller, T. M. Doran, Mabel M. Drummond, Beryl Edgecombe, E. W. Evans, Jennet Evans, A. Fairbairn, A. J. Gill, N. M. Hancox, R. P. Harbord, H. F. Harwood, L. Henry, G. E. Hesketh, A. B. Higginson, E. A. K. Hoppins, F. Lanceley, J. Leiper, H. R. W. Lunt, K. S. E. MacRae, F. T. Madge, J. V. Manning, G. D. Owen, Kathleen M. Pearson, M. N. Phillips, G. Platt,

A. Simpkin, A. Singer, W. S. Sutton, A. C. T. Vaughan, R. E. D. Wheeler, and T. E. Whitby.

D.P.H.

Part I.—Nancy L. Lewis, J. B. Mackie, and Patricia I. Unsworth.

Part II.—A. R. Arulpragasam, A. T. Jones, E. Somasekhar, and J. V. Walker.

D.M.R.E.

Part A.—D. Menzies.

Part B.—D. Menzies, F. O. Pilkington, R. G. Reid, E. Siung, and R. F. Wynroe.

D.T.H.

G. P. A. Amirtha Nayagam and H. R. Shone.

Royal Institution

The managers of the Royal Institution have elected Dr. Edward Mellanby, F.R.S., Secretary of the Medical Research Council, to be Fullerian professor of physiology in succession to Sir Grafton Elliot-Smith. It is expected that Prof. Mellanby will give his first course of lectures in the autumn.

British Postgraduate Medical School

The second refresher course for general practitioners will be held during the fortnight commencing July 15th, 1935. The plan of the course will be on the general lines of the first one, described in our columns last week. The outside specialists taking part in this course are as follows: Dr. C. W. Buckley (Chronic Arthritis); Dr. Geoffrey Evans (Essential Hypertension: Its Diagnosis and Treatment); Dr. A. F. Hurst (Disorders of the Colon); Dr. E. Mapother (Psychiatry in General Practice); Dr. J. L. Livingstone (Asthma); and Prof. L. J. Witts (Common Types of Anæmia: Their Diagnosis and Treatment). Similar courses will be held during the fortnights commencing Sept. 16th and Nov. 18th. Other students can be admitted at any time for a course of hospital practice for periods of six months. Further particulars can be obtained from the dean of the school, Ducane-road, Shepherds Bush, London, W.12.

Rockfeller Medical Fellowships

The Medical Research Council announce that on behalf of the Rockefeller Foundation of New York they have made the following awards of travelling fellowships for the academic year 1935–36:—

David Fyfe Anderson, M.D. Glasg., professor of midwifery and gynæcology, Anderson College of Medicine, Glasgow, and assistant obstetric surgeon, Royal Maternity and Women's Hospital, Glasgow.

Norman Rupert Barrett, M.Chir. Camb., demonstrator of anatomy and chief assistant to the surgical unit, St. Thomas's Hospital.

Alexander Colin Patton Campbell, M.B. Edin., clinical tutor in medicine, Royal Infirmary, Edinburgh; and assistant lecturer, department of pathology in the University of Edinburgh.

Douglas Harry Kedgwin Lee, M.B. Sydney, Sharpey scholar, department of physiology, University College, London.

John Eugene Anthony O'Connell, F.R.C.S. Eng., demonstrator in anatomy, St. Bartholomew's Hospital Medical School.

Robert Walmsley, M.B. Edin., assistant in anatomy, University of Edinburgh.

All the fellowships awarded this year are tenable in the United States. Dr. Lee has been appointed on modified conditions while receiving emoluments from another source.

West London Medico-Chirurgical Society

The fifty-third annual dinner of the society was held at the Trocadero Restaurant, London, on Wednesday, July 3rd, the president, Mr. Howard M. Stratford, in the chair. After the loyal toasts the president presented Mr. Hugh Cairns with the West London Triennial Gold Medal for his recent work in neurosurgery, who in thanking the president said that in thus honouring him they were honouring his colleagues in neurosurgery. The award showed that neurosurgery had taken a secure place in medicine, but the progress that had been made had not been achieved without great effort on the part of the surgeons, and such recognition was of the highest possible encouragement.

The toast of the president and the West London Medical Society was proposed by the Lord Chief Justice, who said that if it had not been for the members of the medical profession some present might not have been born, and some would not have survived. In speaking to the good work done by the society, he recalled that it was founded in 1882 by a surgeon named Keetley, for many years on the staff of the West London Hospital, of whom it had been said that although he was very deaf nothing ever escaped him. The objects of the society were to advance medical science, to help coöperation between the general practitioner and the hospital with its specialised services, to hold scientific meetings for the presentation of research work, to discuss clinical cases, and to recognise and honour those who distinguished themselves in medical science. Associated with the society was the Cavendish lecture which was the only oration delivered under the ægis of the society. In proposing the toast Lord Hewart coupled with it the name of the president, a distinguished Kensington practitioner whose war service was remarkable, for he received his commission on the first day of the war, served on four fronts up to 1918, was torpedoed and twice invalided before he came home "pavilioned in splendour and girded with praise." Mr. Stratford in reply, thanked the Lord Chief Justice for his kind references and said that the members of the society were proud of their body, which was composed of general practitioners and specialists; indeed, he thought that if they had not got the general practitioners they would not have got the consultants. Sir William Osler had said that attendance at medical societies kept a man's mind open, and the president thought that if medical men in London were to use the advantages of the various medical societies there would not be the same need for them to have special postgraduate study. The year of his office had been most successful, but while the enrolment of new members had been one of the largest they had had, he could have wished that there had been more general practitioners among them.

Dr. V. B. Green-Armytage proposed the toast of the guests and kindred societies, and Prof. A. M. Low replied. Mr. L. E. C. Norbury also acknowledged the hospitality of the West London Medical Society.

British Empire Cancer Campaign

Sir Holburt Waring, president of the Royal College of Surgeons, vice-chairman, presided at the fifty-fifth quarterly meeting of the grand council of the Campaign, held at 12, Grosvenor-crescent, London, on Monday last. The following grants were approved: £655 to Dr. Alan Greenwood, of Edinburgh, for the breeding of disease-free brown leghorn fowls; £500 to Mr. F. C. Pybus, of Newcastle, through the North of England Council of the Campaign, for salaries of assistants and laboratory expenses for one year, and £150 for the purchase of apparatus for Dr. Lumsden, working at the London Hospital. The finance committee and grand council also authorised the renewal of the appointment of two assistants to Dr. Lumsden at £500 and £450 per annum.

Lord Horder, the chairman of the scientific advisory committee, submitted a scheme for the coördination of clinical cancer research which had been occupying the attention of the committees of the Campaign for some time. Lord Horder informed grand council that the scheme, which envisages an organisation for coördinating on a scientific basis clinical cancer research, had now received the unanimous support of all the teaching hospitals in London, the medical committee of the L.C.C. as well as a number of specialised hospitals in the metropolitan area. Grand council gave authority for carrying into effect the proposals made, and a general committee is to be formed for this purpose consisting of the nominees of all the coördinating institutions, together with the following representatives of the Campaign: Lord Horder, Dr. R. G. Canti, Sir Charles Gordon-Watson, Mr. J. P. Lockhart-Mummery, Mr. Cecil Rowntree, Mr. Eric L. Pearce Gould, and Mr. W. H. Ogilvie. It was agreed that the scheme should be carried out in the London area in the first instance, but it was hoped that it would be extended to all parts of the country and to the Empire in due course as a result of the experience gained.

Mr. Cecil Rowntree, F.R.C.S., one of the two British representatives and a vice-president of the "Union Internationale contre le cancer" reported to grand council that a general assembly was held on May 4th in Paris, attended by 43 delegates representing 34 countries, and that the international committee had made preliminary arrangements for the convening of an international conference on cancer in Brussels in September, 1936.

It was announced that the annual general meeting of the Campaign will be held on Nov. 25th.

Appointments

DAVIDSON, MAURICE, M.D. Oxon., F.R.C.P. Lond., has been appointed Hon. Consulting Physician to the Papworth Village Settlement, Cambridge.

Vacancies

For further information refer to the advertisement columns

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.

Association of Surgeons of Great Britain and Ireland, 65, Portland-place, W.—Surgical Scholarship. £350.

Barrow-in-Furness County Borough.—M.O.H., &c. £900.

Belfast, Joint Nursing and Midwives' Council, Northern Ireland.—Medical Examiners.

Belfast, Royal Maternity Hospital.—Res. M.O. At rate of £52.

Birmingham Children's Hospital.—Res. Surg. O. £175. Also H.P., H.S., and Cas. H.S. Each at rate of £75.

Birmingham, Dudley-road Hospital.—Jun. M.O. At rate of £200.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Sen. Asst. M.O. £750.

Birmingham, West Heath Sanatorium.—Res. Asst. M.O. At rate of £250.

Bolton, Royal Infirmary.—H.S. £125.

Bradford Royal Infirmary.—H.S. At rate of £135.

British Postgraduate Medical School, Shepherd's Bush.—Anæsthetist. Also 1st Asst. in Dept of Medicine. Each £300 Also 2 H.S.'s.

Cambridgeshire County Council.—Asst. County M.O. £500.

Cancer Hospital, Fulham-road, S.W.—Surgeon.

Canterbury, Kent and Canterbury Hospital.—2 H.S.'s. Each at rate of £125.

Cardiff, King Edward VII. Welsh National Memorial Association. Sen. Asst. Res. M.O. £350. Also Asst. Res. M.O. £200, for North Wales Sanatorium.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Great Barrow.—H.P. At rate of £150.

Chester, Royal Infirmary.—H.P. also H.S. Each £150.

Chorley, Lancs, Chorley and District Hospital.—H.S. At rate of £150.

Colchester, Essex County Hospital.—H.P. Also Asst. H.S. £150 and £120 respectively.

Colonial Medical Service.—M.O.'s. Each £660.

Derbyshire Hospital for Sick Children.—Res. H.S. At rate of £130.

Devonport, Prince of Wales's Hospital.—H.P and Cas. O. At rate of £100.

Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts., Cas. H.S. Also H.S. Each £175.

Dreadnought Hospital, Greenwich, S.E.—H.S. At rate of £110.

Eastbourne, Princess Alice Hospital.—Res. H.S. £150.

Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £120.

Exeter City.—Deputy M.O.H. and Asst. Tuber. O. £600.

Gloucestershire, Royal Infirmary.—2 H.S.'s Each at rate of £150.

Golden-square Throat, Nose, and Ear Hospital, W.—H.S. At rate of £100.

Great Yarmouth General Hospital.—H.S. £140.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—H.P. Also Cas. Surg. O. At rate of £100.

Harrogate Royal Bath Hospital.—Res. M.O. £156.

Hospital for Consumption and Dis. of Chest, Brompton, S.W.—Res. M.O. £350.

Hospital for Sick Children, Great Ormond Street, W.C.—Med. Reg. £300.

Hull Royal Infirmary.—H.P. for Sutton Branch Hospital. At rate of £160.

Huntingdon, Wyton Sanatorium.—H.P. At rate of £150.

Ilford Borough.—Asst. M.O.H. £600.

Ipswich, Mental Hospital.—H.P. £150.

Ipswich, East Suffolk and Ipswich Hospital.—H.P. and H.S. Each £120.

Iraq Government, Basrah Port Health Services.—M.O. 70 Dinars a month.

Jersey General Hospital and Poor Law Infirmary.—Asst. Res. M.O. At rate of £150.

King Edward Memorial Hospital, Ealing.—Jun. Res. M.O. At rate of £150.

King's College Hospital, S.E.—Registrar to Ear, Nose, and Throat Dept.

Kingston-upon-Hull, Beverley-road Institution.—Two Asst. M.O.'s. Each £350.

Lancaster Royal Infirmary.—Jun. H.S. At rate of £130.

Leigh Infirmary, Lancs.—Sen. Res. H.S. Also Jun. H.S. At rate of £175 and £150 respectively.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool. Bootle General Hospital.—H.P. Two H.S.'s. Also Cas. O. Each at rate of £150.

Liverpool, Hahnemann Hospital, Hope Street.—Res. M.O. At rate of £120.

Liverpool, Stanley Hospital.—H.P. and 3 H.S.'s. Each at rate of £100.

Llanelly and District Hospital.—Hon. Part-time Radiologist.

L.C.C.—Asst. M.O.'s. Each £170.

London Skin Hospital, Fitzroy-square, W.—Hon. Physician.

Macclesfield, General Infirmary.—2nd H.S. At rate of £150.

Manchester, Ancoats Hospital.—H.S. At rate of £100. Also Orthopædic H.S. At rate of £100.

Manchester, Crumpsall Hospital.—Two Res. Jun. Asst. M.O.'s. Each at rate of £200.

Manchester, Monsall Hospital for Infectious Diseases.—Jun. Res. Asst. M.O. At rate of £250.

Manchester Royal Infirmary.—Res. Cas. O. At rate of £150. Also Sen. H.S. for Central Branch, Roby-street. £150.

Manchester and Salford Hospital for Skin Diseases.—H.S. At rate of £150.

Montrose Royal Asylum.—Jun. Asst. M.O. £300.

Newcastle-upon-Tyne Hospital for Sick Children.—H.P. and H.S. Each at rate of £100.

Nottingham, Children's Hospital.—Res. H.S. At rate of £150.

Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £150.

Nottinghamshire, C. C. Education Committee.—Asst. School M.O. £500.

Oldham, Boundary Park Municipal Hospital.—Res. Asst. M.O. At rate of £200.

Plymouth, Prince of Wales's Hospital, Greenbank Road.—Asst. H.S. At rate of £120.

Portsmouth City.—Tuber. O. and Sen. Asst. M.O.H. £750. Also Asst. M.O.H. and First Res. Med. Asst. £600–£750. Also Asst. M.O.H. and Second Res. Med. Asst. £500–£700.

Preston and County of Lancaster, Royal Infirmary.—H.S. for Special Depts. At rate of £150.

Queen Mary's Hospital for the East End, E.—Two Cas. and Out-Patient Officers, Each at rate of £150.

Queen's Hospital for Children, Hackney-road, E.—H.S. and Cas. O. Each at rate of £100.

Radium Beam Therapy Research, Radium Institute, 16, Riding House Street, W.—Asst. M.O. At rate of £250

Reading, Royal Berkshire Hospital.—Cas. O. and H.S. Each at rate of £125.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal Naval Medical Service.—Nine M.O.'s.

Ryde, Isle of Wight County Hospital.—Res. H.S. £180.

St. Albans, Middlesex Colony for Mental Defectives, Harper-lane, Shenley.—2nd Asst. M.O. £460.

St. Bartholomew's Hospital, E.C.—Asst. Administrator of Anæsthetics.

St. Helens C.B.—Asst. M.O.H. £600.

St. Peter's Hospital, Vallance-road, Whitechapel, E.—Res. Med Supt. £950.

St. Thomas's Hospital.—M.O. in charge of Physio-Therapeutic Dept.

Sheffield, Children's Hospital.—H.S. At rate of £100.

Sheffield, Royal Infirmary.—Ophth. H.S. At rate of £120. Also H.S. and H.P. Each at rate of £80.

Southend-on-Sea, General Hospital.—Obstet. Officer. £125.

South Shields County Borough.—Asst. M.O. £500.

Stafford. Standon Hall Orthopædic Hospital.—H.S. £200.

Stamford, Rutland and General Infirmary.—H.S. At rate of £250.

Stockport County Borough.—M.O.H. £1100.

Stoke-on-Trent, Longton Hospital.—H.S. £160.

Sutton, Sutton and Cheam Hospital.—Asst. Res. M.O. At rate of £150.

Torqu [illegible] 5.

West [illegible] H.P. At rate of £200.

West [illegible] 73, *Welbeck Street, W.*—Hon. Med. Psychologists for Child Guidance Unit. Also 2 Hon. Clin. Psychologists.

Wigan, Royal Albert Infirmary and Dispensary.—H.S. At rate of £150.

Willesden General Hospital, Harlesden-road, N.W.—Res. Cas. O. At rate of £100.

Wolverhampton Royal Hospital.—H.S. for Fracture and Orthopædic Dept. At rate of £100.

Woodside Hospital, Muswell Hill, N.—Res. H.P. At rate of £100.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E. Res. M.O. £175.

Worcester Royal Infirmary.—H.P. Also Jun. H.S. At rate of £160 and £120 respectively.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Oxted, Surrey.

Births, Marriages, and Deaths

BIRTHS

HARRIS.—On June 22nd, at Clifton, Bristol, the wife of H. Elwin Harris, F.R.C.S. Eng., of a daughter.

MACDONALD.—On June 26th, the wife of A. Robertson Macdonald, M.B., B.S. Lond., of Queen's Club-terrace, W., of a daughter.

MAURICE.—On June 23rd, at Savernake Hospital, the wife of James Maurice, M.R.C.S. Eng., of Marlborough, Wilts, of a daughter.

MARRIAGES

WIGLEY—BARNARD.—On June 25th, quietly, in London, John Edwin Mackonochie Wigley, M.B., B.S. Melb., to Evelyn Barnard, daughter of Mr. and Mrs. Stanley Hoare, of Cornwall-terrace, N.W.

DEATHS

PEACHEY.—On July 7th, at 16, Hillersdon-avenue, S.W., Dr. George Peachey.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

SUSSEX EYE HOSPITAL.—On July 2nd the new buildings of this hospital in Eastern-road, Brighton, were opened by Princess Victoria. They were erected at a cost of £40,000, and they consist of four wards of 10 beds each, eight private wards for paying patients, eight children's cots, and accommodation for the nursing staff.

NOTES, COMMENTS, AND ABSTRACTS

PRESSURE ON URETER BY ECTOPIC TESTIS

ALTHOUGH cryptorchidism in young adults is said to have an incidence of between 0·1 and 0·2 per cent., ectopic testis in the true sense of the term occurs much less frequently. Still less frequently does an ectopic testis give rise to symptoms in the urinary tract. Dr. George C. Prather describes such a rare case in the *New England Journal of Medicine* of March 7th, 1935. The patient, aged 27, was admitted to hospital complaining of a dull pain in the left flank of four years' duration. Abdominal examination revealed an enlarged left kidney, and an intravenous pyelogram confirmed the fact that there existed a left hydronephrosis with a tremendous dilatation of the left ureter. It was noted that the left side of the scrotum was empty. An extraperitoneal exploration of the kidney and ureter was carried out. On dissecting the ureter down to the bladder it was found that it became abruptly narrowed at the point of the crossing of the vas deferens, and on deep palpation a lump corresponding to the left testis was found lying against the posterior wall of the bladder. Since the hydronephrosis and hydro-ureter were badly infected, a nephro-ureterectomy was performed. Convalescence was uneventful and the patient was discharged free from pain 16 days after operation.

A NEGLECTED TONIC: CHARCOT'S BATH

Dr. T. PAGAN LOWE writes to suggest more general use of the form of physical treatment known as Charcot's bath. It requires, he points out, no special apparatus, for it consists merely in standing ankle deep in hot water and sponging the body locally six times. The cold sponge is applied once to each hip, then once to each shoulder, and finally to the chest and back, being followed by quick drying and brisk rubbing with a rough towel. "The bath," Dr. Lowe says, "should be taken on getting up in the morning and again the last thing at night. The rapidity with which it will contract up a dilated heart after influenza is astonishing—a fact which can be observed by anyone who cares to try it. I have seen good results many times, but one case, perhaps, may suffice by way of illustration.

A distinguished physician, after an influenzal attack, thinking his liver wanted exercise, went for a walk up a long and steep hill and thus produced an acute and extensive dilatation of his heart. When I saw him he had been treating himself by rest, two-hourly nourishment and heart tonics without any appreciable benefit, and, to use his own expression, he thought he was done for. Like many other medical men he had never heard of a Charcot's bath, but put it into use forthwith and made a rapid recovery.

The late Dr. Thomas Glynn, of Liverpool, whose house physician I was, and who brought this bath to my notice, gave it as his opinion that for nervous cases and as a general tonic this bath was the best treatment he knew. I have found it also useful in certain cases of insomnia of nervous origin even when an acute anxiety was known to be in operation. To get the best results, however, the bath must be properly administered. Simple though it be, many patients, particularly women, accustomed to the morning hot bath, require to be given it by a nurse for some days before they gain courage to give it themselves."

NURSING OF COLOTOMY

Miss KATE MAXEY, S.R.N., writes (from Bishop Auckland, Durham): Here is a practical hint for the nursing of a colotomy case. From experience I have found that a level teaspoonful of Epsom salts in warm water, followed by a cup of tea, acts after an interval of 40–45 minutes. A bed-pan is contrived consisting of a basin four inches deep and about six inches wide, covered with grease-proof paper fastened with a rubber band. A hole is cut at the centre of the paper large enough to take the colotomy, and the basin is placed at the centre of an air cushion inflated to a depth as great as that of the basin. The patient is then turned on his side over the central hole and kept in this position for three-quarters of an hour. This treatment I have found minimises the unpleasantness for the patient, and also saves soiled bandages, dressings, and garments.

THE VACCINATION QUESTION IN GERMANY

IN his capacity of Reichsärzteführer, or leader of the doctors of Germany, Dr. Wagner has issued a statement pointing out that the Government has hitherto refused to alter the present regulations concerning vaccination, which accordingly remain in force. It is not permissible to criticise the measures that the Government has seen fit to take, nor to stir up opposition to the regulations. "Therefore I rule," he says, "that the vaccination question shall not be discussed in medical and other technical periodicals." (Deut. med. Woch., July 5th, 1935, p. 1094).

THE "KLIPPON" GLARE SHIELD

THIS device, manufactured by Messrs. Theodore Hamblin Ltd., 15, Wigmore-street, London, is designed for the prevention of glare and consists of two dark celluloid shields, joined by a piece of elastic, which are made to clip on to ordinary spectacles. The shields are obtainable at all opticians, price 1*s.* 6*d.*

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, July 16th.—5.30 P.M., General Meeting of Fellows.

ASSOCIATION OF CLINICAL PATHOLOGISTS.
SATURDAY, July 20th (at Princess Alice Memorial Hospital, [illegible] 9.45 A.M., Dr. R. A. [illegible] is. Prof. J. W. McLeod; [illegible] iological Diagnosis of Diphtheria. Dr. A. D. Gardner: Bacteriological Aspect of Whooping-cough. Dr. L. E. H. Whitby: Glandular Fever. Dr. E. Weston Hurst: Pathology of Virus Infections. 2 P.M., Demonstrations by Dr. A. Renshaw and others. 3 P.M., Discussion on Association's pamphlet on When and How to Collect Pathological Specimens. 4.30 P.M., Dr. A. G. Shera: Sensitised Hæmolytic Streptococcal Vaccine. Dr. S. C. Dyke: Case of Aspirin Poisoning. 6 P.M., General Meeting.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, July 15th, to SATURDAY, July 20th.—ALL SAINTS' HOSPITAL, Austral-street, West-square, S.E. Course in urology.—BLACKFRIARS SKIN HOSPITAL, Blackfriars-road, S.E. Afternoon course in dermatology. Courses and clinics arranged by the Fellowship are open only to members and associates.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, July 18th.—2 P.M., Mr. Charles Donald: [illegible] 3 P.M., Dr. A. Signy: [illegible]
Out-[illegible] nd ward visits (except Wednesday) at 2 P.M.

ROYAL SANITARY INSTITUTE.
MONDAY, July 15th, to SATURDAY.—Congress at Bournemouth.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION
St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, July 17th.—4 P.M., Mr. V. Z. Cope: Demonstration of Surgical Cases.

ADDRESSES AND ORIGINAL ARTICLES

CHRONIC DUODENAL ILEUS IN INFANCY AND CHILDHOOD

BY REGINALD MILLER, M.D., F.R.C.P. Lond.
PHYSICIAN TO ST. MARY'S AND PADDINGTON GREEN CHILDREN'S HOSPITALS, LONDON; AND

H. COURTNEY GAGE, M.R.C.S. Eng.
RADIOLOGIST TO ST. MARY'S HOSPITAL

(WITH ILLUSTRATIONS ON PLATE)

DURING the last six years we have been interested in the occurrence of chronic duodenal ileus from arterio-mesenteric compression as a cause of symptoms in early life, and we have published in a specialist journal[1 2 3] details of some of our cases with the evidence—radiographic, operative, and post mortem—on which the diagnosis was based. It is proposed here to give an account of the conclusions which we have sought to establish.

In 1929, when we encountered our first case at an operation on a young child, perusal of the literature brought out the following points of interest in connexion with chronic duodenal ileus in early life:—

(1) Chronic duodenal ileus, established as a comparatively rare condition in adults, is regarded as having two causative factors: first, a congenital anatomical factor, the compression of the duodenum by the root of the mesentery and (usually) the superior mesenteric artery; and secondly, an accessory factor of visceral distension or ptosis whereby the pressure on the duodenum is increased. The congenital factor has had to be assumed; otherwise it would be difficult to understand why visceral distension or ptosis should not always produce duodenal obstruction.

(2) Surgeons investigating their cases of chronic duodenal ileus in adults have found that there is frequently a history of vomiting and dyspepsia in childhood, which symptoms tend to pass off in late childhood or adolescence, to reappear in later life. D. P. D. Wilkie[4] in 1927 laid stress on this interesting point which was confirmed by R. P. Rowlands[5] in 1933.

(3) Arterio-mesenteric compression has occasionally been recorded as a cause of symptoms in young children, and in 1930 we were able to collect from the literature 8 cases between the ages of nine days and four and a half years. In these vomiting of bile had been a conspicuous feature, and the duodenum had been greatly enlarged (megaduodenum), so much so that in some it was visible under the abdominal wall and appeared like "a second stomach." In these two particulars the reported cases differ from those we have met, though it is possible that the difference between the two groups is merely one of degree. In our cases, even in infancy, the vomiting of bile is a rarity, and the duodenum, although enlarged, cannot fairly be described as a gross megaduodenum.

(4) Apart from this group, mainly giving rise to symptoms in infancy, there are very few references to the occurrence of chronic duodenal ileus in early life. A few isolated cases have been reported, but in most details were lacking and in many there were associated malformations or pathological lesions. We collected these cases in 1930.[1]

PRESENT INVESTIGATIONS

In December, 1928, there came under our care a small boy nearly three years old, of such frailty that he weighed only 19½ lb. His symptoms dated from birth, and careful clinical and radiographic examination led us to conclude that there was some obstruction to the evacuation of the stomach—almost certainly not in the stomach itself—which came into play chiefly, if not only, when the stomach was distended. Operation in May, 1929, revealed clearly compression of the duodenum by the root of the mesentery. The clinical history and features of this case were so peculiar that with the clue provided by this operation we were able to recognise milder cases of the same type, and in 1930 we published 9 of them under the title of "gastromegaly and chronic duodenal ileus in children." The term "gastromegaly" was used partly to emphasise the enlargement of the stomach which is the most striking sign in these cases, and partly as a group name because, as only 2 had been verified by operation, we were not sure then that the cause of the obstruction was the same in all. Now that with further experience it seems that the syndrome we described is always due to the same cause, the term "gastromegaly" appears unnecessary although it has become known amongst pædiatric physicians.

In studying these cases in young children we noted that, although typically the most prominent symptom in the earliest weeks of life was refusal of food (congenital anorexia), in a few instances vomiting had developed so soon after birth as to give rise to a suspicion of hypertrophic pyloric stenosis. In May, 1931, we met our first neonatal case in a girl of five days of age. Here although we were able to prove the presence of an incomplete duodenal obstruction, so severe was the vomiting that we failed to consider the possibility of arterio-mesenteric compression, which was revealed at autopsy on the eighth day. Since then, however, we have been able to recognise two other neonatal cases which have progressed well under appropriate medical treatment.

SYMPTOMS, SIGNS, AND RADIOGRAPHY

Symptoms.—As has already been mentioned the gastric symptoms are produced by two factors: the congenital anatomical factor of compression which persists in some degree until at least later childhood; and the accessory factor of gastric distension. The influence of the accessory factor must not be underestimated; it is the cause of the more urgent obstructive symptoms, even in the neonatal cases. Where gastric distension is avoided the stomach seems to become, as it were, compensated by hypertrophy and able to overcome the persistent congenital compression of the duodenum. It is important to realise that in early life gastric distension in these cases depends almost entirely on the amount of food taken, though the degree of gastric stasis no doubt plays its part; and this is the explanation of the fact that the earliest symptoms may consist either of refusal of food or of obstructive vomiting.

Symptoms can usually be traced back to the time of birth, but as in other congenital conditions there are exceptions to this rule. In the majority of cases the chief early symptom is complete lack of appetite; the child does not want its feeds, takes very slowly, and never finishes its bottles. Occasional small vomits may occur, but for the most part the underfeeding keeps the vomiting in abeyance. Progress is naturally slow, but the baby is looked upon as peculiar rather than ill, and no suspicion of any form of obstruction is aroused. At about the age of eighteen months, when the child is taking a mixed solid and fluid diet and can be pressed to take more than it wants, bouts of vomiting begin. In a smaller group of cases vomiting is an early symptom. We have already mentioned that in some of our cases seen at a later age there was a history of suspected hypertrophic pyloric stenosis in the early weeks of life, but in 2 out of the 3 neonatal cases which we have ourselves seen the vomiting was so severe and so obviously due to obstruction that a suspicion of congenital duodenal atresia was raised.

In either of these two groups the vomiting of obvious bile is exceptional. Even in the neonatal cases this is true, and only gastric lavage showed traces of bile in our cases.

Seen after the age of infancy—and most of our cases came under observation between the ages of two and eight years—these children are frail and underweight, but not notably stunted in height. It is rather characteristic that their complexions are pink and clear, showing neither the muddy skin of the intestinal dyspeptic nor the pallor of cœliac disease. Their chief symptoms are persistent lack of appetite and periodic attacks of vomiting. The anorexia is severe and is little influenced by purges, treats, or holidays. The frequency of the vomiting attacks depends greatly on what amount of food the child is made to take. The vomit shows accumulated food and mucus, and the attack is accompanied often by high fever and followed by diarrhœa with sometimes an excess of sodden mucus in the stools. A further rather characteristic symptom is hiccup, though its presence is seldom referred to by parents spontaneously. It is produced by a moderate degree of gastric distension and may be a warning of an attack of vomiting. Its disappearance under treatment is one of the earliest signs of improvement. The tongue is habitually coated, and the breath tends to be offensive.

As regards the bowels, constipation is not as prominent a symptom as might be expected, and if the bowels are disordered it is usually towards diarrhœa. Probably the persistent chronic gastritis readily sets up an enteritis. In some instances, especially in the younger children, the stools may contain much thick, sodden, and bile-stained mucus, which probably originates in the stomach. An excess of fat may appear in the stools from time to time, and we have had fat analyses as high as 59 per cent. of the dried fæces. Although such steatorrhœa is exceptional and always transient, it is worth bearing in mind in connexion with both diagnosis and treatment. It is presumably due to some interference with the flow of bile behind the duodenal obstruction. In several of our cases an opaque meal showed the colon to be unduly voluminous.

In 2 of our cases the intestinal symptoms have been much more in evidence than the gastric, and the child has suffered more from diarrhœa than from vomiting.

As will be seen from this account of the symptoms, although the past history may be rather characteristic, the symptoms themselves do not point at all clearly to any form of organic obstruction.

Physical signs.—The most characteristic physical sign is the protuberance of the upper abdomen from the enlarged and hypertrophied stomach (gastromegaly). This is best seen when the child is lying down but is often obvious in the upright position. The outline of the stomach may be clearly visible, and after a meal or draught of soda water gastric peristalsis may be observed in a good light. On palpation the wall of the stomach may give the sensation of being thickened, and gastric splashing may be elicited at any time.

Radiographic examination by means of an opaque meal has many uses in cases of chronic duodenal ileus. In severe neonatal cases it serves to distinguish between complete and incomplete duodenal obstruction. In milder instances at any age, where the presence of any form of obstruction may be doubtful, it serves to establish it by demonstrating gastric hyperperistalsis combined with delayed emptying-time of the stomach. It fairly easily excludes the pylorus as the site of the obstruction and this of itself tends to incriminate the duodenum. With careful technique the duodenal cap may be seen to fill easily and be enlarged, and with perseverance stasis in the lower part of the duodenum may be caught, although this cannot be guaranteed at any single examination. With good fortune the wall of the stomach may be seen to be definitely hypertrophied.

In order to get the best results two points require attention. First, the volume of the opaque meal must be considerably greater than that normally used for the age of the child; otherwise the enlarged stomach will be imperfectly filled and even delayed emptying-time may be missed. Secondly, it is much easier to get good views of the duodenum if gross gastric dilatation has been relieved by previous treatment. In the neonatal cases the meal should be given directly after the stomach has been washed out. Oblique and lateral views should be used to study the duodenum.

If the opaque meal is given before treatment has been instituted a peculiar picture is often seen. The stomach is much enlarged and stretches across the abdomen obliquely, almost ovoid in shape and projecting so far to the right as to hide the pylorus and duodenal cap completely even in oblique views. Very little is seen in the way of peristalsis and only small quantities of the meal pass on into the jejunum. This picture, although very characteristic to those familiar with it, cannot be taken to prove the presence of duodenal obstruction. It is essential that the duodenal cap should be seen at some part of the examination in order to demonstrate a normal pyloric canal with no increase in the pyloro-duodenal gap. If the meal is repeated after treatment has restored something of the gastric tone, the stomach, although still greatly enlarged, is more normal in outline, and in oblique views the duodenal cap is seen to be well filled and enlarged. Stasis in the lower parts of the duodenum as it runs to the middle line may be seen, and gastric hyperperistalsis and stasis, the combination typical of obstruction to the evacuation of the contents of the stomach, will certainly be seen.

DIAGNOSIS AND TREATMENT

It will be convenient to discuss these subjects in the two groups of cases, neonatal and later, separately.

1. *Neonatal group.*—In the cases seen in the first few weeks of life the differential diagnosis depends on the severity of the obstruction symptoms, and this in turn seems to depend at least as much on the distension of the stomach as on the persistent compression of the duodenum with which the child is born. If obstructive vomiting is present from birth the case will simulate one of congenital duodenal stenosis or atresia; if it develops later it may be mistaken for one of hypertrophic pyloric stenosis, pylorospasm, or non-obstructive dyspepsia. Our 3 neonatal cases show these differences well; we give them in the order in which we met them.

Case 1.—Female; vomiting from birth; seen 5th day. Opaque meal showed large stomach passing only minute quantities of meal into small jejunum. Vomit showed much mucus but no obvious bile. Operation on 7th day: stomach large, duodenum large; cause of obstruction not recognised. Autopsy on 8th day revealed arterio-mesenteric compression.

Case 2.—Female; vomiting from birth; seen 10th day. Stomach large; vomit projected, containing much mucus but no obvious bile. Immediate opaque meal showed dilated lower œsophagus, with large ovoid stomach emptying very little food into jejunum. In the hope of duodenal ileus operation was postponed and gastric lavage ordered. First lavage stopped all serious vomiting; first two washings showed traces of bile. On 16th day second opaque meal showed large stomach with improved tone and emptying-rate, and obvious duodenal stasis (Fig. I. on Plate). Progressed well. At 5 months (weight, 17½ lb.) visible gastric peristalsis still present. Third opaque meal showed stomach emptying well by hyperperistalsis, and duodenal stasis again seen. At 12 months reported progressing well.

Case 3.—Female; vomiting from birth slight, but severe after first three weeks; seen aged 8 weeks. Stomach large, peristalsis visible, vomit projected and containing much mucus but no obvious bile. Immediate opaque meal showed large ovoid stomach with stasis; barium vomited 10 hours after ingestion. Lavage showed traces of bile. At 11 weeks second opaque meal showed stomach emptying more quickly. At 12 weeks third opaque meal given immediately after lavage showed duodenal stasis. Progress satisfactory. At 6 months (weight, 12½ lb.) died of diphtheria. Autopsy confirmed presence of arterio-mesenteric compression.

In cases where severe vomiting dates from birth it may be difficult except by radiography to exclude duodenal obstruction from congenital malformation of the duodenum. In nearly all instances of this condition the obstruction is complete, and if the opaque meal discovers that the obstruction is incomplete we would urge that operation be postponed for one or two days to try the effect of gastric lavage. In our experience the commonest cause of a congenital incomplete duodenal obstruction is arterio-mesenteric compression. Partial obstruction by bands has been reported as a great rarity, but there is reason to think that in some instances such bands have been merely complicating arterio-mesenteric compression.

Where obstructive vomiting appears in the first few weeks of life rather than at birth, pyloric stenosis can be readily excluded. Pylorospasm is a painful condition and mucus is not vomited. Non-obstructive dyspepsia should be excluded by the enlargement of the stomach, the presence of visible gastric peristalsis, and the obstructive type of vomiting in which the vomit is copious, projected, and containing excess of mucus. The use of an opaque meal will confirm the presence of obstruction.

Three points in diagnosis require emphasis. First, the absence of obvious bile in the vomit does not preclude the presence of chronic duodenal ileus. Secondly, the persistent presence of an excess of mucus in the vomit in a chronic case of vomiting in a young infant signifies obstruction at the pylorus or in the duodenum. Thirdly, to get the best results in the use of an opaque meal the meal should be large and given directly after the stomach has been thoroughly washed out.

As regards treatment in the neonatal cases, gastric lavage seems quickly to stop serious vomiting by restoring the tone of the distended stomach and reducing its emptying-time. For this purpose a dilute solution of sodium bicarbonate probably deals better with the mucus in the stomach than normal saline and appears quite harmless. Lavage should be given at first every 12 hours, and when the washings become clear the intervals may be increased to 24, 36, and 48 hours. Lavage every two or three days will probably be needed for about three months. Distension of the stomach or large projected vomits are indications for more frequent lavage. The feeds should be spaced by the emptying-time of the stomach which is easily estimated in a small infant by passing a tube four hours after a meal. It should be borne in mind that under treatment the emptying-time of the stomach quickly improves.

2. *In late infancy or early childhood.*—The chief difficulty in diagnosis here is to recognise the possibility of the presence of any obstructive factor in the production of the symptoms. In only 2 of our cases had any investigations on these lines been made before they came under our care. On the other hand in several instances the mother had observed the peculiar protuberance of the child's upper abdomen and had tried to interest the doctor in this phenomenon. Apart from the fact that the history may date from birth or early infancy, the symptoms of lack of appetite and attacks of vomiting will hardly allow the child to escape the label of "acidosis." Perpetual hiccup, if inquired for, is suggestive. The diagnosis must be made on the clinical and radiographic signs; the enlarged protruding stomach, the visible peristalsis, and the persistent splashing suggest stasis and obstruction, which can be confirmed by the evidence given above afforded by the use of an opaque meal.

Treatment by medical measures is not unsatisfactory. In the younger children a certain degree of underfeeding may be unavoidable, but in the older children, who are already beginning to improve spontaneously, progress may be quite dramatically successful. Bearing in mind the importance of the volume of the feeds and the tendency to gastric stasis, it is essential to separate the fluids from the solid food as far as is possible and to give meals well spaced apart. A mixed diet, slightly low in fat, should be given mainly minced and as dry as may be palatable, and drinks should be given about three hours after meals. A mixture containing ½-drachm doses of glycothymolin (K. and O.) with rhubarb and soda is very useful in the early stages. Later, hydrochloric acid drinks may be allowed with meals. Paraffin should be avoided as an aperient. Massage and ultra-violet light may be a help.

Although the amount of exercise allowed may have to be curtailed to suit the subnormal intake of food, it is unwise to keep these children entirely in bed for any length of time. Exercise and fresh air help their digestions.

As regards the possibility of relieving the duodenal obstruction by operation, in the neonatal cases the risk is so extreme that medical treatment should at least be given a trial. In the older children it must be clearly understood that the enlargement of the duodenum is not sufficient to render the operation of duodeno-jejunostomy a possibility. Gastro-jejunostomy has not been found a success in adult cases of chronic duodenal ileus, and from our experience of 2 cases in children it is a disappointment in them also. The indications are to be satisfied with slow improvement rather than to resort to operation.

In the cases showing gross megaduodenum, which we have mentioned but have not met, duodeno-jejunostomy would presumably be the correct procedure.

PROGNOSIS AND COURSE.

In our 2 neonatal cases in which gastric lavage was employed improvement was dramatic. By treating the accessory factor of gastric distension satisfactory progress was made in spite of the persistence of the congenital obstruction. That all cases would show similar improvement is perhaps doubtful, but in both our cases the obstruction appeared severe.

In cases seen at a later age treatment tends to stop the vomiting attacks, but in the younger children progress may be slow as it may be difficult to get a normal amount of food tolerated by the stomach. In children of eight or ten years old, in whom spontaneous improvement is to be expected, the effect of treatment may be a great success.

As Wilkie pointed out, there is a tendency towards spontaneous improvement in later childhood. This seems to take place at about the ages of eight or ten, and is probably due to the growth of the child. These children therefore, unlike most cases of cœliac disease, will be able to get to preparatory boarding schools. But we are by no means sure that all attain to complete freedom from symptoms. We suspect that some examples of severe gastric dilatation seen at puberty or in adolescence derive from congenital duodenal ileus, and we have had one such case under our care at the age of seventeen years who developed acute duodenal ileus following laparotomy fifteen years later. During childhood this post-operative complication seems practically unknown, and several of our patients have been through operations for the removal of tonsils or appendix without untoward results.

SUMMARY

Chronic duodenal ileus arising from congenital arterio-mesenteric compression of the duodenum is described as a cause of obstructive symptoms (*a*) in the newly born, and (*b*) in later infancy and early childhood; and its symptoms, signs, diagnosis, course, and treatment are discussed.

REFERENCES

1. Miller, R., and Gage, H. C.: Arch. Dis. Childhood, 1930, v., 83.
2. Miller and Gage: Ibid., 1932, vii., 65.
3. Miller and Gage: Ibid., 1935, x., 179.
4. Wilkie, D. P. D.: Amer. Jour. Med. Sci., 1927, clxxiii., 643.
5. Rowlands, R. P.: THE LANCET, 1933, i., 1107.

CORTICAL CARCINOMA OF THE SUPRARENAL

WITH CUSHING'S BASOPHIL PITUITARY SYNDROME

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THE clinical signs characteristic of the syndrome, conveniently called basophilism, which has been attributed to basophil adenoma of the pituitary are now well known. The close parallelism between this syndrome and that regarded as being produced by hyperfunction of the suprarenal cortex in adult women has recently been emphasised. The following is the report on a case of carcinoma of the suprarenal cortex in which special investigation of the pituitary (A. C. C.) has led to the observation of cytological changes hitherto unrecognised. Briefly, the chief clinical symptoms and signs were attacks of severe headache and vomiting, and persistent metrorrhagia followed by amenorrhœa. Hirsutism, of the male type, with loss of scalp hair, greasy skin, an acneiform eruption, and striæ atrophicæ. These were associated with an adiposity of face, neck, shoulders, and trunk, and the limbs were slender. The patient developed kyphosis, and had polycythæmia and a raised blood pressure. At operation a malignant suprarenal tumour was removed and metastases were found at the post-mortem.

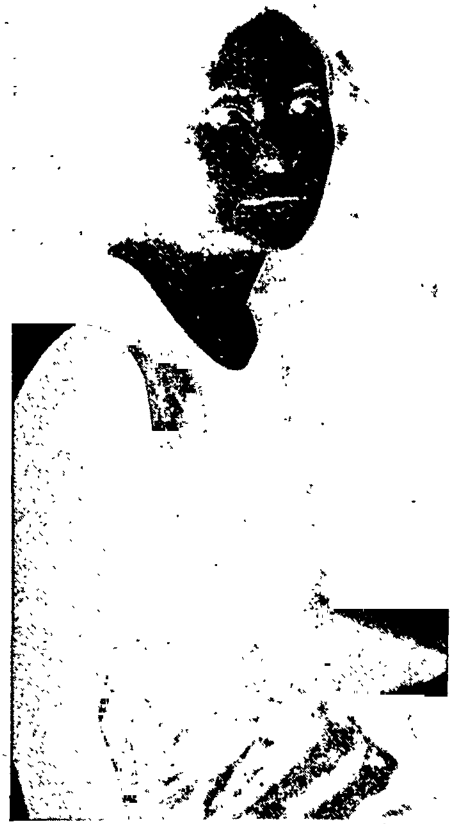

FIG. 1.—The patient at age of 24 (1926).

The patient, a machinist, was the tenth of a healthy family of twelve children. She was unmarried, the menses were regular, and she had had no previous illnesses of importance, and was in good health (Fig. 1) till November, 1931, when she missed two menstrual periods and began to be languid and sleepless. After an attack of tonsillitis in February, 1932, the menses became gradually prolonged, lasting up to six weeks, the daily loss not being at any time excessive; during 1933 the average duration was from seventeen to twenty-one days with irregular intervals; this was followed by amenorrhœa from February, 1934, interrupted by a slight menstrual discharge on May 24th and another in December, 1934; a slight brownish discharge was present at other times.

Changes in facial appearance were noticed early in 1933. The complexion, previously good, became spotty, the scalp hair broke off short, and the beard began to grow in April, 1933. The patient gained about half a stone in weight during 1933, and made a further gain of fourteen pounds during 1934. The maximum weight was 139 pounds. Headaches, to which she was always liable, increased in frequency, severity, and duration; vomiting was liable to occur on waking, or would follow the development of the headache. She complained of a sense of weight and discomfort in the epigastrium, particularly on walking, and was liable to attacks of giddiness. The appetite was very good but not excessive. Thirst was increased and nocturnal frequency of micturition occurred. She noticed no change in her voice. No history of hæmorrhages or bruising was obtained, except a slight hæmoptysis in January, 1934. Mentality and efficiency were unimpaired. The patient continued at work until December, 1934, except during the period between Feb. 6th and May 31st, 1934, when she was an in-patient at the Royal Free Hospital. During this period she was shown at a meeting of the clinical section of the Royal Society of Medicine.[1] She was kept under continuous observation during 1934, and progressive changes in her appearance were noted; though there was little change in the symptoms, she felt progressively less able to carry on her work.

Her physical condition did not change much between February, 1934, and December, 1934 (see Figs. 2, 3, and 4), when she presented a masculine appearance. She was 5 ft. 2 in. in height, florid, with rounded shoulders, kyphosis of the upper thoracic and cervical spine, short thick neck and double chin, heavy trunk and prominent abdomen with relatively slender limbs, hands and feet. The face and extremities were congested, and the lips a deep colour. The skin over forehead and cheeks was thick and coarse with few creases; it was greasy, and there was an acneiform eruption on face and back. The scalp hair was dark, short and curly, and brittle, and made hardly any growth; there was a tendency to baldness in the centre and over the temples, which had been exposed to X ray treatment. She had a reddish beard, clipped about once a week, which grew thickly below the chin and less profusely in the whisker and moustache areas. A line of hair extended from pubes to umbilicus, sparse hairs were present round the nipples, and excess of fine hair on the front of the thighs, but no excess of hair elsewhere on the limbs. The adipose tissue was distributed chiefly on the lower part of the face, neck, shoulders and trunk; the abdomen was prominent. Two purple striæ atrophicæ were present at this date; none were seen in February, 1934. The breasts were small and of the obese male type.

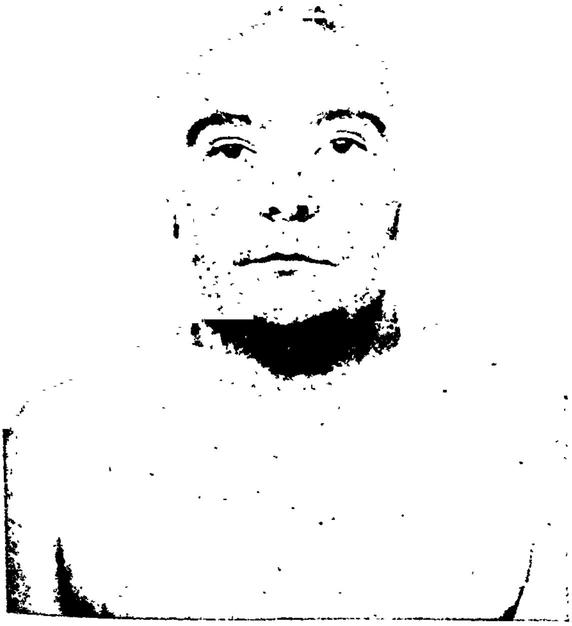
FIG 2.—The patient at age of 32 (March, 1934).

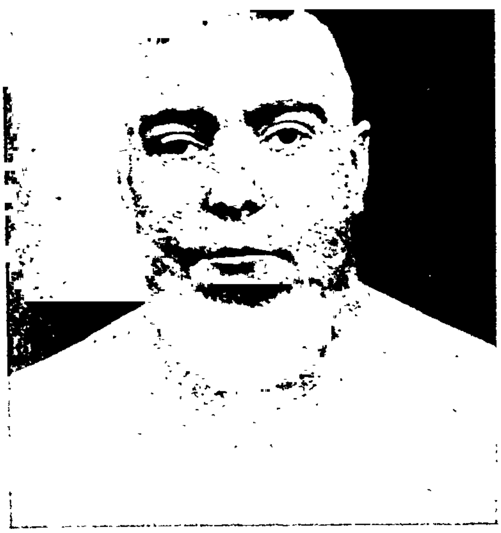
FIG. 3.—The patient in December, 1934.

The *heart* was slightly enlarged, the action forcible, and the sounds clear. The electrocardiogram showed a left-sided preponderance. The blood pressure was: systolic 205 mm., diastolic 140 mm. Hg on Dec. 29th. The abdominal wall was very thick and prominent, and the liver, spleen, and kidneys were not palpable; no tumour could be felt. The external genitalia were normal except for a slight enlargement of the clitoris. The cervix was small and soft and the uterus could not be defined. In lungs, urinary, and central nervous systems, nothing abnormal was found. The fundi were normal and the fields of vision and blind spot also normal.

Special investigations.—In February and March, 1934, the case was studied in detail. An X ray of the pituitary fossa showed it to be rather smaller than normal, the antero-posterior diameter being 11 mm. The outlines of the kidney (intravenous pyelogram) appeared normal and a skiagram of long bones, with control, showed no lack of Ca salts.

The Wassermann and Kahn tests were negative. Examination of urine gave a normal urea-concentration

TABLE I.—*Blood Counts*

Date in 1934.	Hb %.	R.B.C.	C.I.	W.B.C.
Feb. 13th	126	7,620,000	0·8	16,000
April 27th	102	5,780,000	0·9	9,400
Sept. 21st	122	6,770,000	0·91	21,500
Oct. 19th	116	4,660,000	1·23	14,400
Dec. 4th	114	5,720,000	1·0	11,550
,, 14th	Platelets 8 per cent. or 441,000 per c.mm.			

Between February and April 5 X ray treatments given to the pituitary region. From the end of September phenylhydrazine grs. 1·5 was given twice weekly, total grs. 12

Blood Analysis. Results in mg. per 100 *c.cm. Blood*

Urea.	N.P.N.	Urea/N.P.N.	K.	Phosphatase units.	Ca.	Cholesterol.
38	37·7	38·3	2·32	0·148	10·9	161·3

which is stained a uniform greyish-blue by the modified Mallory method. The extent of this hyaline change shows great variations, which are apparently stages of a progressive involvement of the cytoplasm. In most of the cells the greater part of the cytoplasm is hyaline. In some of these the granular cytoplasm is reduced to a narrow zone in the extreme periphery of the cell body and also a demilunar or rounded area against the nucleus, which in the case of an eccentric nucleus lies against the side upon which the cytoplasm is most abundant. In others the granular cytoplasm is confined to one or other of these two sites. In many cells the entire cytoplasm is hyaline. A few medium or large vacuoles, similar to those often seen in normal ripe basophil cells, may be present in the hyaline cytoplasm. The remnants of granular cytoplasm are usually finely vacuolated. This vacuolation is especially conspicuous in remnants that form a rim round the cell. The nuclei of the affected cells show no sign of degeneration, and two or more nuclei are sometimes present. No mitoses were observed. The change was not found in the basophil cells in the posterior lobe.

TABLE II

Percentage of different cells in 94 normal adult non-pregnant females (Rasmussen, 1933)

Cell types.	Minimum.	Maximum.	Median.	Mean and probable error.	Standard deviation	Coefficient of variation.
Chromophobe	32·9	74·1	49·0	49·6 ± 0·47	6·79	14
Acidophil .	19·2	57·5	44·2	43·4 ± 0·56	8·10	19
Basophil . .	3·0	15·6	6·6	7·0 ± 0·20	2·94	42

TABLE III

Percentage of different cells in two cases of adreno-cortical syndrome

	Our case.	Lescher and Robb-Smith's case.
Chromophobe	49·78	31·5
Acidophil	45·81	50·25
Basophil	4·41	17·25

REMARKS

There is a marked discrepancy between the count of the percentages of different cells in the pituitary gland in this case and the count in the case of carcinoma of suprarenal cortex associated with an almost identical syndrome of basophilism which has been described by Lescher and Robb-Smith.[2] In the present case the percentage of basophil cells was within the normal limits and slightly above the minimum found by Rasmussen[4] in adult women. Lescher and Robb-Smith, on the other hand, in their case found a percentage slightly above the maximum of Rasmussen. It is, unfortunately, not possible to judge the extent to which the two imitations of the method of Rasmussen[3] give comparable results. The method employed in this case has been described in detail and its conformity to Rasmussen's method has been tested by a count of the gland from a normal man[5]; the percentages obtained were close to the modes found by Rasmussen[3] in 100 normal adult males. Prolonged deep X ray therapy had been directed to the pituitary fossa in this case, so that the possibility of this having reduced the number of basophil cells must be considered. There is, however, no evidence that X rays destroy basophil cells more than chromophobe or acidophil cells. Further, there is no evidence of degeneration of the basophil cells unless it be the hyaline change that has been described in the cytoplasm. Dr. Robb-Smith has kindly sent us a section of the pituitary gland from the case described by him with Dr. Lescher. No X ray treatment had been given in this case. The section, when stained by the Mallory method, shows exactly the same hyaline change in the basophil cells. The hyaline change cannot, therefore, be attributed to X ray therapy.

The occurrence of this hyaline change, its nature, and its significance in the syndrome of basophilism are discussed by one of us (A. C. C.) in another paper, which will shortly be published. The view will be put forward that it should be considered to be an expression of altered physiological activity and not a degeneration in the sense of a change leading to the death of the cell.

SUMMARY

A case clinically indistinguishable from the syndrome attributed to basophil adenoma of the pituitary gland is reported. A carcinoma of the suprarenal cortex was removed at operation and metastatic growth was found at autopsy. In serial sections of the pituitary gland no basophil adenoma was found. The differential cell count was within normal limits. A hyaline change in the basophil cells of the anterior lobe is described.

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VENTRICULOGRAPHY BY OPAQUE INJECTION

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(WITH ILLUSTRATIONS ON PLATE)

NEUROLOGICAL surgery owes much to pneumography of the cerebral ventricles, introduced by Dandy, which in the hands of the expert neurological surgeon has been, and will doubtless continue to be, of inestimable value in the diagnosis and localisation of brain tumours.

There are, however, numerous difficulties in the interpretation of ventriculograms, largely due to the fact that it is only the "air shadow" which is differentiated in the radiograms from the surrounding brain tissue, whereas any residual fluid remaining in the ventricular system is not so differentiated. This residual fluid, lying in pools at the most dependent parts of the ventricles, often confuses the picture, for it may be impossible to say whether an abnormality of the ventricular contour is due to this fluid or to something in the brain tissue, or in the cavity of a ventricle.

In ventriculography by the method of air injection we are therefore reduced to two alternatives: we may either drain the ventricles very completely in order to obtain a complete "air-cast" of the entire ventricular system, or we may partially fill the ventricles with air, and then make a series of radiograms with the head in different positions, using the air bubble to explore successively the contours of different regions of the system. The latter is the method usually employed in Mr. Jefferson's clinic at Manchester Royal Infirmary, since it avoids the severe and often dangerous alterations in intracranial tension which may follow total air replacement. This "piecemeal" method involves numerous changes in the position of the patient, and the taking of a large number of films; the technique is somewhat exacting, and in order to outline the third and fourth ventricles the patient must adopt a position amounting to inversion of the head.

One of us (E. W. T.) has worked out a technique for this which has been described in a paper[1] read before the section of radiology, Royal Society of Medicine, in November, 1933, and in more elaboration in a paper before the Society of British Neurological Surgeons in November, 1934.

Although the methods just mentioned have afforded convincing data, certain difficulties connected with the interpretation of ventriculograms, usually due to pools of residual cerebro-spinal fluid, prompted the suggestion by one of us (E. W. T.) that a "double-contrast method" would be of considerable assistance. By "double-contrast method" is meant the introduction of a radiopaque diffusible material into the ventricles which would differentiate the fluid-filled part of the ventricles from the surrounding brain, as well as from the air introduced. Alternatively, it was foreseen that the diffusible material might be introduced instead of air, which would produce opaque ventriculograms, and would avoid the alteration of intracranial tension which accompanies air replacement. It was hoped that an image might be obtained of sufficient density to render possible satisfactory stereoscopic views of the ventricular system, since stereoscopic views of the *air*-filled ventricles are notoriously unsatisfactory, owing to lack of contrast.

Various substances were considered. *Lipiodol*, so commonly used for opaque injections of the spinal theca, was thought to be unsuitable because it is not miscible with cerebro-spinal fluid, but tends to collect into droplets. *Uroselectan* was next considered, and an attempt was made to render the intraventricular cerebro-spinal fluid opaque by injecting 5 c.cm. of this substance. The resultant shadow was of very unsatisfactory density. *Thorotrast* was then suggested (E. W. T.) as being suitable. This substance is frequently used for injection of the arterial system and has been injected in quantities of 60 c.cm. into arteries and veins, being non-toxic when so used. It later becomes deposited in the reticulo-endothelial system, chiefly of the liver and spleen. Preliminary experiment showed that it was readily diffusible in water and in cerebro-spinal fluid, and that a concentration of 1 in 8 would give a good radiographic shadow. It was therefore decided to use the method in the following case, in which there was evidence of cerebral tumour with conflicting localising signs—a case in which it was felt essential to obtain the utmost possible detail of the ventricular contours, while avoiding total ventricular drainage.

A CASE FOR INVESTIGATION

The patient, an engine driver aged 50, was a well-developed muscular man. His illness began abruptly on the evening of Feb. 13th, 1935, with a general headache, which became very severe, necessitating his going to bed, and rendering him incapable of going to work the next morning. Since that time he had suffered from severe generalised headaches, which came on every morning and lasted for a few hours. They were commonly associated with vomiting. There had not been any deterioration of vision, and from his wife it was ascertained that he had changed considerably, in that he had become drowsy and distant in his manner. There were no other symptoms.

On admission to hospital on April 2nd he seemed extremely drowsy, but on closer investigation it was found that usually he was not asleep, but rather disinterested in the surrounding activities of the ward. On being questioned he would answer slowly but quite rationally; he was not apathetic about his own condition, but very willing to coöperate. There was no aphasia or urinary incontinence.

He had a low-grade bilateral papillœdema, rather more obvious on the left side, but no other neurological signs apart from a slight fine nystagmus to the right, and an indefinite extensor plantar response on the left side. The Wassermann reaction was negative in the blood and cerebro-spinal fluid. A radiographic examination of the skull revealed no evidence of cerebral tumour, and the protein content of the cerebro-spinal fluid was 80 mg. per 100 c.cm., the normal being 25 mg.

A diagnosis of a cerebral tumour was made, but it could not be localised with precision, the suggestions being an intraventricular tumour (because of the high cerebro-spinal fluid protein content), a right frontal meningioma, or a tumour of the corpus callosum. A ventricular estimation was performed (G. F. R.) which proved: (1) that there was no lateral displacement of the ventricles; (2) that they were in communication; and (3) that they were dilated. Again sufficient evidence was not forthcoming to permit of localisation, and it was therefore thought necessary to make a ventriculographic examination. In view of the presumptive diagnosis of intraventricular tumour, a complete study of the outlines of the ventricles was desirable. Accordingly, in view of the man's condition, and of the risk attending total air replacement, it was decided to adopt the above suggestion of injecting a suitable amount of radiopaque diffusible substance.

THE METHOD AND ITS RESULTS

With the patient lying on the left side 25 c.cm. of fluid was withdrawn from the right ventricle, and 10 c.cm. of air was introduced, followed by 10 c.cm. of thorotrast. The thorotrast was poured into the funnel used for the reception of the cerebro-spinal fluid, and mixed with it by agitation. It was then run into the ventricles by raising the funnel. Radiograms were made within 15 minutes. Diffusion of the thorotrast had been completed by this time as the radiograms showed even density in both ventricles. The presence of opaque cerebro-spinal fluid in the left ventricle proved that the lateral ventricles communicated freely.

A complete series of ventriculograms was made. The patient's condition was good. He did not complain of the headache generally present when air replacement is employed. The pulse-rate was 100 and he was sweating rather freely; but his mental condition was undisturbed, he coöperated readily, and he had no toxic symptoms.

The success of the injection from a radiographic point of view was very gratifying (Figs. I.–III. on Plate). The ease with which the third ventricle was shown should be noted. This method necessarily succeeds in showing the third ventricle (if the foramina of Monro and the ventricular cavity are patent), because it is filled with cerebro-spinal fluid, mixed with the opaque medium. The 10 c.cm. of air which was introduced in this case collected for the most part in the uppermost ventricle in the lateral lying position, and in the frontal horns in the supine position, so that there was very little air in the third ventricle at any time. The contours of this ventricle were therefore very clearly delineated in all views. The fourth ventricle was also outlined.

In order to ensure filling of the third and fourth ventricles by opaque fluid, lateral films were also taken with the patient sitting up—thus reversing the technique we ordinarily use to fill it with air (inversion method). This is very simple, and gets over the difficulty which has attended the use of air ventriculography of the third ventricle; for in that procedure it is often difficult to get rid of all the fluid in the third ventricle, which tends to remain in the suprapineal recess at its posterior end, and therefore introduces an element of doubt into the interpretation of the ventricular contours. The new method eliminates this difficulty. It is the most dependent point of the ventricle which is shown as an opaque shadow, exactly as in a barium investigation of the *alimentary tract.*

THE RADIOGRAMS AND THEIR INTERPRETATION

The radiograms were of outstanding clarity and definition.

The lateral ventricles were slightly hydrocephalic. The right lateral ventricle showed a striking deformity: it was flattened from above downwards, and depressed below the level of the left. The deformity was most marked in the body of the ventricle, the frontal horn showing depression but less conspicuous deformation than the body. The right temporal horn was compressed from side to side and the right occipital horn flattened. The ventricles were not appreciably displaced from the mid-line. The foramina of Monro were *patent, and the third ventricle lay in the middle* line.

The lateral view showed a large rounded filling defect occupying the posterior two-thirds of the third ventricle; the aqueduct of Sylvius was compressed and distorted; the fourth ventricle outlined (though somewhat faintly, owing to the compression of the aqueduct).

Interpretation is extremely difficult. The flattening of the body of the right lateral ventricle on its upper side suggests a lesion of the corpus callosum. The possibility has to be considered that it results from a right temporal tumour, since it is well known that a temporal lobe tumour may cause this deformity by displacing the corpus callosum under the falx cerebri, so that the ventricle on the side of the tumour is lower than that on the opposite side.[2] But in this case there is no appreciable displacement; the cause of the flattening must therefore be above the ventricle, possibly in the corpus callosum itself.

The deformity in the posterior end of the third ventricle is very striking. If unaccompanied by any deformity of the lateral ventricles it would point to a pineal tumour, choroidal plexus tumour, or other tumour of the third ventricle. It is impossible on the radiograms to eliminate these, but in the presence of an associated deformity of the right lateral ventricle the possibility arises that the third ventricle deformity may be due either to (1) an enlargement near the posterior end of the corpus callosum, pushing the posterior contour of the third ventricle forwards; or (2) a bulging of one optic thalamus towards the mid-line.*

After the radiograms were made the patient was again taken to the operating theatre and 20 c.cm. cerebro-spinal fluid was removed from the ventricles. This was compared with test mixtures made up in test-tubes containing thorotrast and water. Mixtures of 1 in 2, 1 in 4, 1 in 8, 1 in 16, and 1 in 32 were radiographed in test-tubes of equal diameter together with the specimen of cerebro-spinal fluid obtained *from the patient's ventricles, all being included in a* single exposure. The radiographic density of the specimen was less than that of a mixture of thorotrast and water, 1 in 4, but greater than a mixture of 1 in 8. It was estimated as 1 in 6.

Further radiographic examination two hours later showed that almost all the thorotrast had left the ventricular system, only a faint shadow being now visible. It was not possible to say how much had been removed, and how much had leaked away into the spinal theca. Only a trace of air remained.

A second case of ventriculography by thorotrast injection is demonstrated in Fig. IV. This radiogram is a lateral view from a case of verified right-sided acoustic neuroma. It demonstrates clearly the normal *outline of the lateral and third ventricles and of the* aqueduct of Sylvius. The anatomical points depicted in the radiogram are illustrated in the line diagram, Fig. IV.*a*. The contour of the normal third ventricle in this radiogram should be compared with that of the deformed third ventricle in the first case (Fig. I.).

DISCUSSION

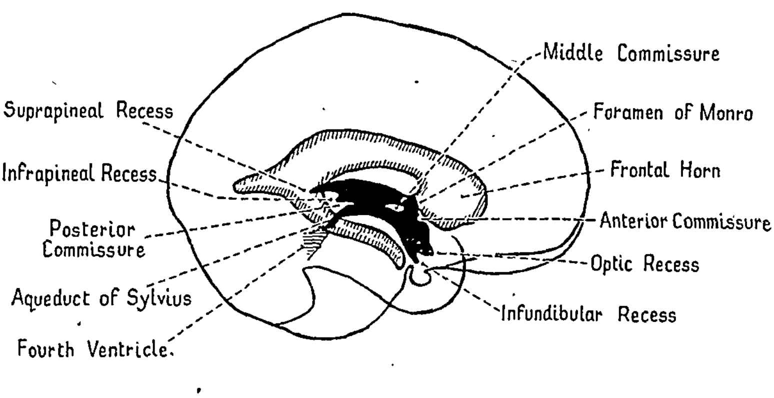
Other radiopaque substances have been used for ventriculographic examination, notably lipiodol (Sicard, Paraf, and Laplane, 1923). Balado has employed lipiodol since 1928, and Lysholm[3] has recently published an extensive review of that method. Lysholm refers to risks attending its use, especially in the presence of stenosis of the aqueduct and fourth ventricles.

It must be emphasised that lipiodol is not miscible with cerebro-spinal fluid. It is therefore only used in small quantities as an accessory to air replacement. It cannot be used for complete outlining of the ventricles. The method we describe, of using a substance which is freely miscible with cerebro-spinal fluid, offers considerable advantages. Radiographically the results surpass those of air injection in density and definition, and in the ease with which the whole ventricular system can be shown, not only in its main features, but also in its fine details. Stereoscopic views are extremely satisfactory.

From the point of view of the patient's well-being the method offers the great advantage that intracranial tension is unaltered, and that the not inconsiderable risk of air replacement (estimated by some authors to have a mortality of 10 per cent.) is obviated.

Our results were obtained with thorotrast, which from a radiographic point of view is adequate. Other workers have doubted the suitability of thorotrast to which they have ascribed irritative properties.

FIG. IV.a



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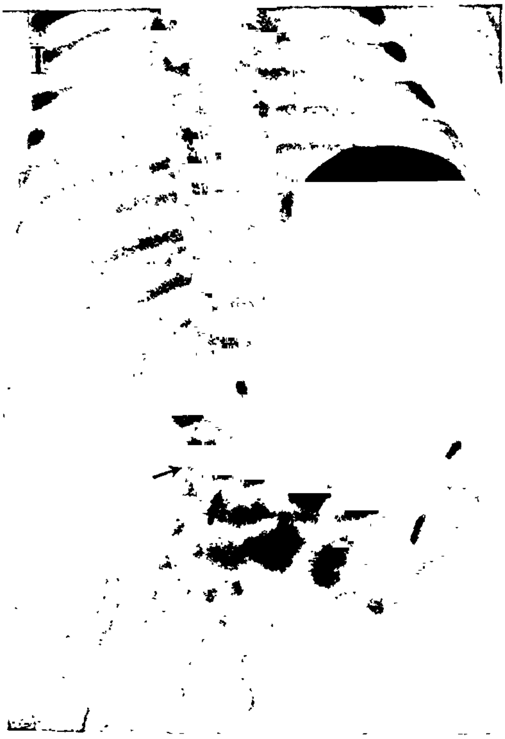
* Presence of tumour of the optic thalamus was later verified. Tumours were also present in the cerebellum and in the right cerebrum above the corpus callosum.

DRS. MILLER AND GAGE : DUODENAL ILEUS

FIG. I. (Case 2).—Aged 16 days. Opaque meal on ingestion, pro Œsophagus dilated, stomach enlarged, duodenum shows stasis (arrows).

FIG. II.—Girl aged 8 years. Opaque meal at two hours, prone. Enlarg stomach showing hyperperistalsis ; duodenal stasis.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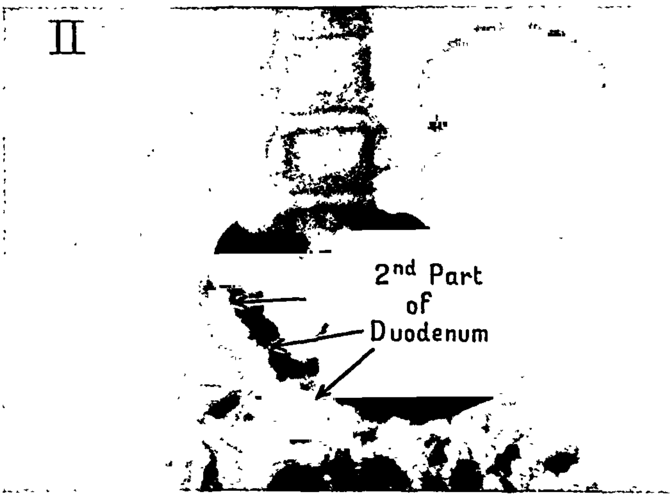
II

DR. TWINING AND MR. ROWBOTHAM : VENTRICULOGRAPHY BY OPAQUE INJECTION

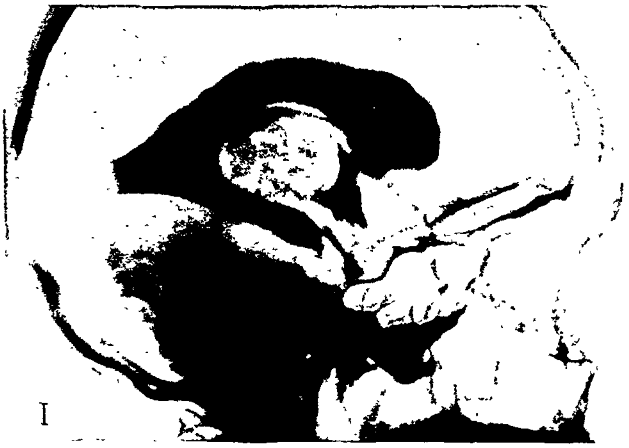
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FIG. I.—Lateral ventriculogram (left side down). Deformed right lateral ventricle. Rounded filling defect in posterior end of third ventricle.

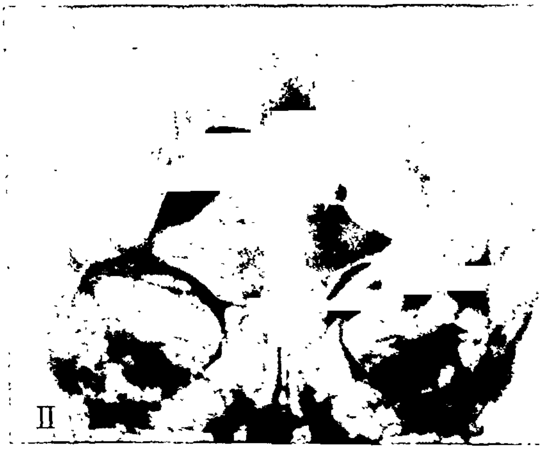
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FIG. II.—Same case. Antero-posterior radiogram (supin Body and temporal horn of right lateral ventricle deformec

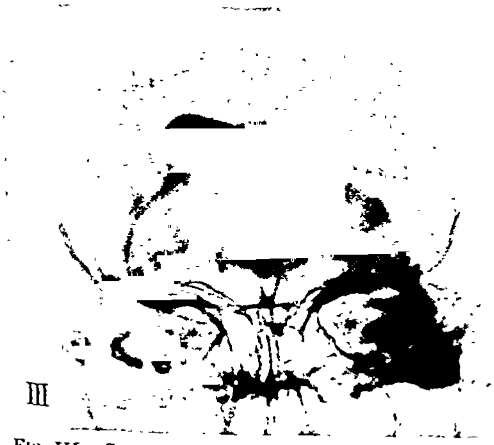

III

FIG. III.—Same case. Postero-anterior radiogram (prone).

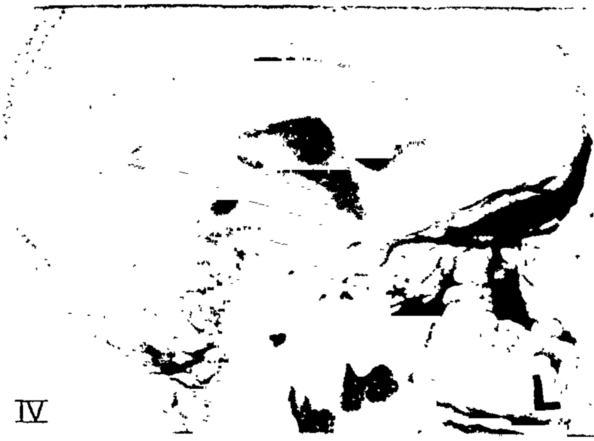
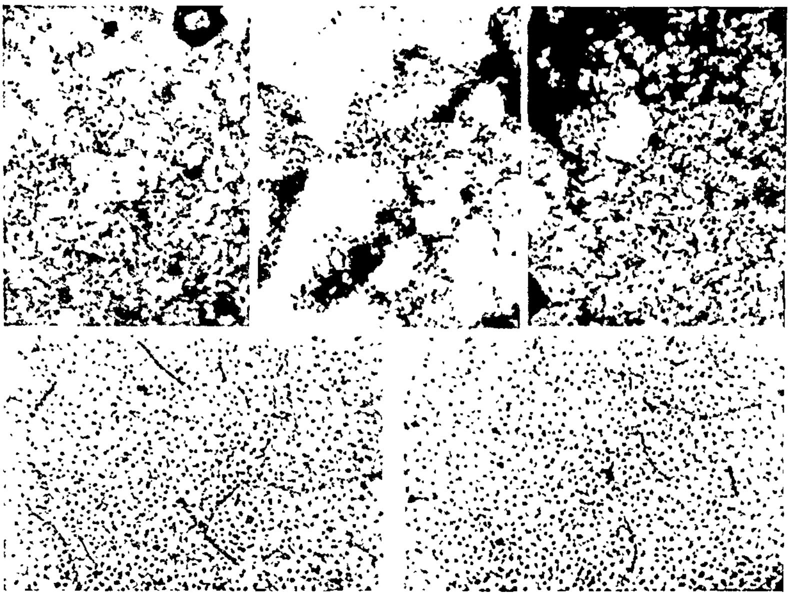
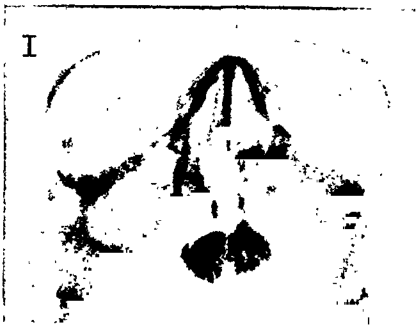

IV

FIG. IV.—Lateral ventriculogram from a case of right acoust neuroma (see Fig. IVa. in Text).

DR. COLES: VIRUS BODIES IN RHEUMATISM



MR. STRONG AND DR. BARCLAY: INFECTION OF ANTRUM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II

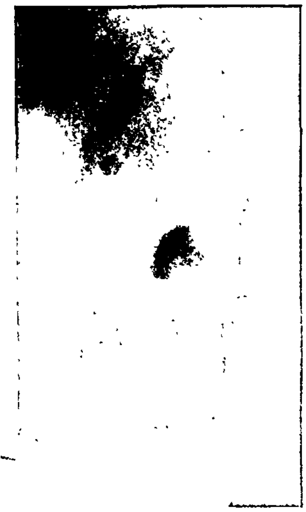
III

PROF. ELLIS: SIGNIFICANCE AND TREATMENT OF PYELITIS

Ib

II

III



Va

Vb

VI

In four cases observed in this clinic for periods of up to three weeks between thorotrast injection and operation, there have been no alarming or serious symptoms. The immediate condition of the patients after injection compared extremely well with that of patients who have had air replacement. The latter usually complain of headache, often severe, and tolerate the necessarily lengthy and complicated X ray examination badly. By contrast, the patients who had thorotrast coöperated well in the examination, which caused them no inconvenience. Our general impression is that the immediate effects of thorotrast are milder than those due to air. We cannot yet claim that it is the ideal substance; it has been shown by Alexander,[4] in experimental work in the dog, to cause proliferation of the ependymal cells, which apparently become phagocytic to the thorotrast granules. This proliferation, which is also caused by oily substances (e.g., olive oil) might conceivably produce late effects. A longer time of observation is necessary for the full evaluation of end-results. We believe, however, that the method in principle is correct, and that it may supersede air replacement for the following reasons: (1) Complete outlining of the ventricular system is obtained with greater possibilities of precise interpretation. (2) It simplifies radiographic technique (3) Stereoscopic radiography is possible. (4) There is a minimum interference with compensated intracranial pressure, thus diminishing risk of tumour shift and hæmorrhage.

Our best thanks are due to Mr. Geoffrey Jefferson for permission to publish the cases described in this preliminary communication, and for his interest and coöperation.

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VIRUS BODIES IN THE PERICARDIAL FLUID OF RHEUMATIC FEVER

AND OTHER CONDITIONS, AND IN THE JOINT FLUID OF RHEUMATOID ARTHRITIS

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(WITH ILLUSTRATION ON PLATE)

In certain instances of infection where larger organisms cannot be found and the infective agent is unknown, close observation has revealed the presence of minute bodies that can be seen by appropriate illumination or stained by suitable procedures. In some cases the presence of specific antibodies such as agglutinins has been demonstrated for these "elementary bodies"; and in at least two examples—viz., vaccinia and psittacosis—further evidence has been forthcoming that the bodies in question are the actual virus of the disease, because when separated off by high-speed centrifuge and injected into animals they reproduce the disease.

For years past I have spent much time in searching for virus bodies in such material as I have been able to obtain from likely cases—e.g., vaccinia, varicella, herpes, molluscum contagiosum, psittacosis—and amongst other material I have now examined a considerable number of specimens of pericardial fluid for such bodies. In view of the interesting and promising results of Schlesinger and his colleagues[1] published in THE LANCET of May 18th on the elementary bodies in rheumatic fever, it has occurred to me that these observations, made quite independently of their work, may possibly be of some interest.

Methods.—Films were made from the exudate as thin as possible at one end and considerably thicker at the other end of a slide. These when dry were fixed in alcohol for about 5 to 10 minutes, and then stained in well-diluted Giemsa for 24 hours. At the end of 12 hours the stain was usually renewed. Although all virus bodies are clearly stained in 12 hours, preparations which had been subjected to the stain for 24 hours were preferred. When the stained films were quite dry I often found it advantageous to differentiate part of the smear by pouring a few drops of orange-tannin on half the film, and after allowing this to act for about 5 minutes, the whole slide was washed in running water. In some cases films were also made with Indian ink, as in Burri's method for demonstrating *Sp. pallida*. Quite early in my work I entirely gave up the use of any of the mordanted stains with aniline dyes or with silver, as used in flagella staining, as I found that

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[1] Schlesinger, Signy, Amies, and Barnard: THE LANCET, May 18th, p. 1145.

LEGENDS TO ILLUSTRATIONS ON PLATE

DR. COLES: VIRUS BODIES IN RHEUMATISM

Photomicrographs of Giemsa-stained films (× 1135). Upper row from exudate on visceral layer of pericardium. Lower row from suspension in broth (1 in 10) of pericardium.

MR. STRONG AND DR. BARCLAY: INFECTION OF ANTRUM

FIG. I.—Radiogram showing abnormally dense shadow in region of left antrum.

FIG II.—Radiogram of left upper central incisor, after removal, showing passage of root filling through the apex.

FIG. III.—Occlusal film showing areas of rarefied bone passing up into the floor of the left antrum.

PROF. ELLIS: SIGNIFICANCE AND TREATMENT OF PYELITIS

FIG. I.—Normal pelvis and ureter. (a) The right pelvis is in diastole and is much larger than the left, which is in systole. (b) Same patient 20 minutes later. The right pelvis is in systole and is now smaller than the left, which is in diastole.

FIG. II.—Normal pregnancy at fifth month. Pelvis and ureters dilated; ureters tortuous.

FIG. III.—Excretion pyelogram showing large pyonephrosis in a man who had been treated for four years as a case of pyelitis.

FIG. IV.—Multiple calculi in a patient with "pyelitis" of pregnancy. No previous urinary symptoms.

FIG. V.—Ureterocele found on routine examination of a patient with *B. coli* pyelitis. (a) Excretion pyelogram showing dilated ureter and filling defect in the bladder. (b) Cystogram showing large clear area at the site of the ureterocele.

FIG. VI.—Excretion pyelogram showing bilateral hydronephrosis due to ureteral obstruction by bilateral salpingitis. This patient had been under observation for seven years with attack of recurrent "pyelitis."

infinitely clearer and much more reliable images of all virus bodies were obtained by the slower Giemsa staining.

OBSERVATIONS

During a research, extending over more than two years, in which I have been coöperating with Dr. M. H. Gordon on various virus diseases, notably cases of lymphadenoma, I have had ample opportunity of examining microscopically numerous pathological material for virus bodies, and as controls.

Rheumatic fever.—Although rheumatic fever has been regarded as having many of the characters of an infective disease, the actual exciting cause still seems undetermined. Various cocci, diplococci, and more especially streptococci, have been suggested as the probable cause, yet none of these has received general acceptance.

Dr. Gordon sent me films made from recent exudate on the visceral layer of the pericardium of a boy of 16 who had succumbed, on April 17th, 1934, to acute rheumatic fever with pericarditis, and also a little later some capillary tubes containing a 1 in 10 suspension in broth of the inflamed pericardium. On microscopical examination of the Giemsa-stained films made directly from the pericardium I saw very small but very definite round or oval bodies, mostly isolated, a few in pairs, but rarely in chains. They were faintly stained red with Giemsa and were best seen on the stained fibrin background. They resembled all other virus bodies, not only in their difficulty in staining a faint red colour, but also in the fact that they show minute flagella-like appendages when carefully examined under a high power. Giemsa-stained films when examined by dark-ground illumination show these minute bodies very distinctly, and small as they are, they appear as very conspicuous and distinctive objects even when seen with the 8 mm. apo. objective, especially with the comp. ocular 18.

Films made from the suspension in broth, fixed and stained as above, show masses of these small bodies some singly, many in twos or threes, and not a few in short chains. Here they were often seen connected together by exceedingly delicate filaments. Films made from the suspension with Indian ink as in Burri's method show the character and shape, and especially well the filaments connecting three or four of these bodies.

The actual size of these virus-like bodies is very difficult to determine, but when measured by Nelson's extinction method they appeared to vary from about 0·17 to 0·26 μ in diameter, and measurements taken from photomicrographs give very similar figures. They are considerably smaller than the Paschen bodies of vaccinia or the Hodgkin bodies of lymphadenoma. It is well however to point out that measurements of virus bodies in general, as made by such experts as Mr. E. M. Nelson and Mr. Eliot Merlin, differ very considerably from those given by most English workers, especially when estimated by filtrative methods, and I generally find that my estimation of size is about double that given by such workers.

The accompanying photomicrograph (reproduced on Plate), taken from Giemsa-stained preparations, gives a better idea of the appearance of these very small bodies than any verbal description.

Pericardial fluid.—From June to November, 1934, Dr. Gordon kindly sent me both the fluid and films from the pericardial exudate of 50 cases dying from various causes. These patients, whose age ranged from infancy to extreme old age, had died from the most varied conditions—accidents, sepsis, malignant, leukæmia, hydrocephalus, meningitis, &c. Of these exactly half showed virus bodies closely allied to those found in the endo- and pericardium of rheumatic fever. Of course, in some other bacteria—e.g., diplococci, streptococci—were also present.

Rheumatoid arthritis.—During July and August, 1934, films and fluid from affected joints—mostly the knee-joint—were sent by the late Dr. Vincent Coates, through the kind office of Dr. Leo Delicati, from the Royal Mineral Water Hospital, Bath. These joints had, I understand, been aspirated as part of the treatment, and the notes stated that in most of these cases many joints are now affected. In 3 out of 5 of these cases I found very numerous virus bodies resembling those seen in the pericardial fluid of the case of rheumatic fever.

Dr. Douglas Collins, who had been appointed for special research work at the Royal Bath Hospital, Harrogate, kindly sent fluid from the knee-joints of 3 cases of rheumatoid arthritis. One of these fluids was unfortunately contaminated, but in one of the other two very numerous virus bodies were found. Earlier in the year fluid and films from a case at St. Bartholomew's Hospital were sent, and this proved positive. Thus out of 9 cases 5 at least were positive. In all these cases films were stained also with Ziehl-Neelsen's method, and a prolonged search was made for acid-fast bacilli, as these have been said to be often present in the joint fluid of cases of rheumatoid arthritis. In none of them did I find any evidence of tubercle or other acid-fast bacilli.

COMMENT

The questions which naturally arise are what do these small bodies—which have all the characteristics of the virus bodies found in many filtrable diseases which I have been studying for more than 20 years—represent? Are they the actual infective cause of acute rheumatic fever on the one hand, and of rheumatoid arthritis on the other; and how is the presence of somewhat similar bodies in 50 per cent. of the pericardial fluid of other conditions to be explained?

These are questions which it seems impossible at present to answer. My impressions are that probably the virus bodies found in the pericardial fluid of the case of rheumatic fever and those found in the joint fluids of rheumatoid arthritis may belong to the same species, and might well represent the actual causal organism. From a clinical and pathological aspect both these diseases are more closely associated with a virus than a bacterial origin, but I must leave the solution of these questions to those more able to answer them, and time may solve some of the problems. In this brief note I have only recorded what the microscope has revealed.

I would here like to record my sincerest thanks to Dr. M. H. Gordon, F.R.S., for his invaluable help, suggestions, and kindness in supplying me with material over such a long period.

GLOUCESTERSHIRE ROYAL INFIRMARY.—The workpeople's contributory scheme has obtained 15 new groups. A new X ray department and a new nurses' lecture room are to be added to the hospital.

WESTON-SUPER-MARE HOSPITAL.—The work of this hospital continues to expand, and last year the total number of in-patients was 1126, which constituted a record. The number of out-patients has increased from 795 to 1131 in the last two years. Ordinary income exceeded ordinary expenditure by £272. The completion of the buildings and equipment caused an expenditure of over £3000 on capital account.

PYELITIS

ITS SIGNIFICANCE AND TREATMENT*

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(WITH ILLUSTRATIONS ON PLATE)

The subject I have chosen for my lecture has three attractions: first, it is one of the few conditions common both in the wards of a hospital and in general practice; secondly, it is one which is amenable to treatment; and thirdly, there have lately been advances in our knowledge of it which may not yet be generally familiar.

Pyelitis is common; its symptomatology is well known and the diagnosis usually easy. Accordingly I do not propose to say anything here about symptoms and about diagnosis, only to recall that when the condition occurs in infants it is readily missed; hence it should always be remembered as a cause of pyrexia of unknown origin in these patients. The general public commonly speak of pyelitis as "cystitis"; but primary cystitis is in fact relatively rare, and the great majority of cases of so-called cystitis are in women examples of pyelitis, in men of prostatitis. Acute cystitis, when it does occur, is usually accompanied by a degree of strangury greater than that seen in acute pyelitis and usually also by tenderness over the bladder, a sign which is absent in pyelitis.

THE SIGNIFICANCE OF PYELITIS.

An appreciation of the anatomy and physiology of the pelvis of the kidney and ureter is essential to an understanding of the significance of pyelitis. The renal pelvis and ureter are not, as we used to consider them, merely passive structures conducting the urine secreted by the kidney to the bladder, but are active structures with muscular walls, which, by their contraction, pass the urine along its appointed course. We now know that both pelvis and ureter have a slow peristaltic activity. We believe also that there is a sphincter-like action at the point of junction of pelvis and ureter and also at the opening of ureter into bladder. The accompanying intravenous pyelograms show well the difference in size of the pelvis in systole and in diastole (Fig. I. on Plate).

The importance of this conception of the active flow of urine in the pelvis and ureters lies in the fact that only when interference with the outflow of urine is present is infection of the pelvis of the kidney likely to occur. The importance of proper emptying in the prophylaxis of bladder infections is generally recognised. A normally emptying bladder is infected with difficulty and, if infected, usually rapidly recovers; whereas in the bladder with retained urine even the most careful catheterisation leads to infection and this infection is difficult to overcome until adequate drainage is established. It is perhaps not so generally appreciated that the same rule holds for the pelvis of the kidney. The normally acting pelvis, ureters, and bladder are rarely infected and clear rapidly if they are, whereas anything which leads to a retention of urine within them renders them at once susceptible to infection and makes such infection difficult to overcome.

This brings us to the causes of obstruction of urine within the renal pelvis. This method of approach is valuable, because it gives us a rational understanding of the causes of pyelitis and should *lead* to the examination of our patients with pyelitis for such obstruction. No case of pyelitis should be considered satisfactorily explained until some cause of urinary obstruction within the bladder, ureter, or pelvis has been demonstrated.

Pregnancy easily occupies first place as the commonest cause of obstruction to normal urinary flow; it is not surprising therefore that it is also the commonest cause of acute pyelitis. From the results of intravenous pyelography we have learnt that dilatation of one or both ureters, most frequently the right, is so constant in pregnancy that it may almost be described as normal. The degree of dilatation is well demonstrated in Fig. II., which is a pyelogram taken at the fifth month of an uncomplicated first pregnancy. The explanation of this dilatation is still quite uncertain; it is not known whether it is due to direct pressure of the gravid uterus on the ureter or to paralysis of the nerves supplying it, or to some quite other mechanism. The dilatation begins quite early in pregnancy, persists until after parturition, and then rapidly subsides; as a rule the ureter and pelvis seem to regain their normal appearance about three weeks after delivery. There is some evidence that the occurrence of infection may retard this return to normal and that in some cases of chronic pyelitis the ureters and pelvis remain permanently somewhat dilated.

The other causes of urinary retention in the pelvis and ureters, and an accompanying pyelitis, are much less common and important. Calculus, which probably also acts by locally lowering the resistance; malformation of the urinary tract, such as double pelvis, double ureter, and displaced pelvic-ureteric openings; aberrant renal arteries constricting the ureter; tumours of the kidney or pelvis or of [illegible] structures pressing on the ureter; inflammation [illegible] within the kidney, such as renal tuberculosis, [illegible] outside it, involving the ureters—e.g., with [illegible] and neuromuscular defects leading to [illegible] opening of the sphincteric orifices—[illegible] causes which are met with, and [illegible] looked for, in cases of pyelitis not [illegible] explained. The frequency of [illegible] of the ureters and renal pelvis [illegible] bladder due to prostatic enlargement [illegible] of the spinal cord needs no [illegible] of the bladder symptoms [illegible] attention to the [illegible] former group of cases [illegible] ureter and pelvis only [illegible] lying lesion is apt to [illegible] of the pyelitis is [illegible]

The following cases [illegible] thorough investigation [illegible] pyelitis:—

Case 1.—[illegible] under treatment [illegible] had various [illegible] vaccines. [illegible] and [illegible] in the [illegible] [illegible] three months pregnant, this being her first pregnancy. For two months she had had increasing frequency of micturition. On examination there was tenderness in the region of the right kidney. The urine contained pus and *Bacillus coli* and radiography showed a group of shadows in the right renal region (Fig. IV.). Cystoscopy (indigo-carmine): left, 6 minutes; right, no colour after 10 minutes. Both ureters catheterised: left, normal urine; right, pus and *B. coli*. This patient had never any urinary symptoms before her pregnancy. Two months after delivery Mr. Dix performed a nephrectomy; a grossly damaged kidney with multiple calculi was removed.

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* A post-graduate lecture at the London Hospital.

CASE 3.—E. F., a female aged 43, was admitted to the London Hospital with pain in the back and frequency. Two weeks before admission she had had a sudden onset of pain in the small of the back, with shivering and headache; there was burning pain on micturition and frequency. The symptoms lessened after three days and she had felt better until the day before admission when she had a similar attack; her doctor had found albuminuria. Fourteen years ago she had influenza followed by "fluid in the chest," she was in Victoria Park Hospital at that time. The patient is married and has one child; she had no urinary disturbance during the pregnancy. Examination showed a furred tongue, fever, and pyuria; it was otherwise negative.

The symptoms cleared rapidly with treatment. A routine intravenous pyelogram showed a conspicuous dilatation at the lower end of the right ureter (Fig. V.). On cystoscopic examination this proved to be a large ureterocele.

CASE 4.—G. H., a girl aged 18, had been under observation since 1927 with recurrent attacks of "pyelitis," in which there was pain in the back, some frequency, and puffiness of the face and ankles in the morning. The urine consistently contained either pus, or numerous leucocytes, and grew *Bacillus coli* on culture. X ray and cystoscopic examination had been carried out in 1931 with negative results. Uroselectan pyelography revealed definite left hydronephrosis and some dilatation, but no deformity of the right pelvis (Fig. VI.). Operation revealed bilateral streptococcal salpingitis, with abscess formation on the left side and an inflammatory mass incorporating the left Fallopian tube and ovary, fixed to the iliac vessels and pelvic wall, and obstructing the left ureter. The whole mass was removed between ligatures.

Above I have described conditions within the urinary tract predisposing to its infection; but it should be remembered that the foci of infection in other parts of the body, such as the appendix and the gall-bladder, may also play a part. This is often emphasised by those writing on pyelitis. In my own experience I have not been impressed with its importance, but it is perhaps not without significance that among the relatively few patients whom I have treated with a ketogenic diet two have shown symptoms suggesting exacerbation of chronic gall-bladder infection.

TREATMENT

The treatment of pyelitis may be conveniently divided into the treatment of the acute condition with relief of symptoms and the treatment of chronic cases and the eradication of the infection. The former is one of the most satisfactory therapeutic procedures we have; the latter unfortunately gives much less good results.

The treatment of the acute condition is extraordinarily simple; it consists in the administration of adequate doses of alkali over a sufficiently prolonged period. The important words in the above sentence are the qualifying ones—"adequate" and "sufficiently prolonged." Over and over again one is asked to see cases of acute pyelitis which are not responding adequately to treatment; almost always this result is due simply to failure to give the drug in sufficient doses for a long enough time. In using alkalis it is the common practice to use a mixture of alkaline salts. This is, I think, a mistake. It is my experience that a single salt is less likely to cause nausea and vomiting than a mixture. I use potassium citrate, grs. 60 in ½ ounce of water with syrup of orange or lemon to flavour. Half an ounce of the above mixture—that is, pot. cit. grs. 60—is given 2-hourly for eight doses and then 4-hourly. If after 36 hours of such treatment the urine is still acid, 2-hourly doses should again be given. When all symptoms have disappeared the alkali may be reduced to three doses in 24 hours, provided this is adequate to maintain the urine alkaline to litmus. A very common error is to discontinue the alkali too early or to substitute for it acid sodium phosphate and hexamine The administration of alkali should be continued for weeks and should be *maintained after the patient is up and about.* If nausea or vomiting are induced by the citrate, potassium or sodium acetate, which are equally effective, should be tried: some patients can take the one and not the other. I have personally entirely discarded the use of hexamine in these cases.

With adequate treatment with alkalis the symptoms usually disappear rapidly; the pain goes, the temperature returns to normal, and the pus in the urine diminishes. Occasionally these measures are unsuccessful, and in spite of adequate alkali therapy the pain persists, the temperature remains elevated, and further rigors occur. Such patients are usually very ill and their condition may give rise to anxiety.

Recently, with the assistance of Mr. Dix, I have obtained very successful results in such circumstances by continuous drainage of the renal pelvis through a ureteric catheter. The ureter is catheterised and the catheter passed into the pelvis of the kidney and left in situ for 48–72 hours. The change in the patient is dramatic; the pain is instantly relieved, the temperature quickly falls, and the restlessness and toxic manifestations disappear. We have now treated three patients in this way with uniformly successful results. In the two instances in which we examined the urine obtained from the kidney pelvis by catheterisation we found it acid to litmus, although the bladder urine was, and had been on the previous day, alkaline. Moreover, indigo-carmine injected in one case seven, in the other eight, minutes before the catheterisation had not yet appeared. This suggests that in these patients swelling, or other interference with the pelvic-ureteric opening had occurred, with retention of urine and a resulting rise in pressure within the pelvis of the kidney sufficient to prevent the secretion of urine by that kidney. This failure of the kidney to secrete, and the resulting acidity of the urine is sufficient explanation of the failure of alkalis to relieve symptoms. The immediate relief of pain which follows the introduction of the catheter suggests that the severe pain in these patients is due to the increased pressure within the pelvis. It has been very noticeable that, in each instance after pelvic catheterisation, a prolonged and continuous rapid flow of urine greatly exceeding the normal has resulted. I feel that pelvic drainage by ureteric catheter is a very important addition to our treatment of acute pyelitis; its use will, I believe, result in a disappearance of the case refractory to alkali therapy.

The treatment of chronic pyelitis and the elimination of the infection after an acute attack may be considered together. Unfortunately our methods of treatment are here much less satisfactory. Acute attacks of *B. coli* pyelitis in children usually show complete recovery without relapse and with elimination of the infection. In acute pyelitis of pregnancy, by far the commonest form in the adult, chronic pyelitis, relapsing acute ttacks, and basal cystitis with persistence of *B. coli* in he urine are, on the other hand, so frequent as to be lmost the rule. It is probable that this persistence of nfection is dependent on inadequate emptying of the pelvis and ureters, due either to mechanical defects or to disturbance in the emptying mechanism due to the chronic inflammation. As yet our methods are inadequate to demonstrate such an effect in most cases, but the frequency of the association of infection with anatomical abnormalities and the relative rarity of infection of the normal pelvis make tenable such an hypothesis.

In the treatment of chronic pyelitis a ketogenic diet has been advocated. On such a diet very rich in fat and very low in carbohydrate, ketone substances are excreted in the urine. These ketones are bactericidal, especially in a highly acid urine. It is usual therefore to give, along with the diet, acid-producing salts such as ammonium chloride or ammonium nitrate in relatively large doses. My own experience with this form of treatment is insufficient to dogmatize. There is no doubt that it often does lead to elimination of the infection—in about half the cases in the experience of most authors. My own experience suggests that the treatment is difficult to carry out without the assistance of a trained dietitian. Even with the assistance of a dietitian I have found it quite inapplicable to out-patient treatment. The diet is trying to most patients and some find it impossible. In two instances I have seen symptoms suggesting an exacerbation of a dormant cholecystitis in patients on the high fat diet. It is probable that when efficiently carried out its success or failure depends on the adequacy of pelvic emptying in the particular case.

Other urinary antiseptics, such as hexamine, neotropine, and hexyl resorcinol, are often employed. I have not had much success with them. Vaccines I have not used and I know of no satisfactory evidence of their efficiency.

Renal lavage with colloidal silver undoubtedly relieves pain in some patients with chronic pyelitis. Occasionally the urinary findings also improve and pus and bacteria may disappear from the urine. It is questionable whether the benefits obtained are due to the substance injected. Not infrequently such patients are equally relieved by the passage of a ureteral catheter or the making of a pyelogram. It may well be that the improvement following renal lavage is due merely to improved drainage resulting from the pelvic catheterisation. Renal lavage should, in my opinion, be done only by the expert. In unskilled hands considerable discomfort and actual damage may result from its use.

The most common sequel of acute and chronic pyelitis is basal cystitis, in which a chronic inflammation with multiple cyst formation is present about the trigone and neck of the bladder. It is this condition which is most often responsible for the persistence, or recurrence, of painful and frequent micturition in patients who have previously had pyelitis. Treatment with alkalis will often give symptomatic relief in this condition, but is also often ineffective. In such patients symptomatic relief is usually obtained by careful local treatment with caustics or cautery. This, like renal lavage, is a treatment to be employed only by those well versed in the technique of cystoscopy, unskilled interference not infrequently resulting in exacerbation of the existing condition.

In conclusion may I again plead for a careful and thorough investigation of all cases of unexplained pyelitis; and for an adequate use of alkalis in the treatment of the acute condition.

A DIRECTOR FOR THE INSERTION OF THE SMITH-PETERSEN NAIL

IN COLLUM FEMORIS FRACTURES

By Eric I. Lloyd, M.B. Camb., F.R.C.S. Eng.

ORTHOPÆDIC SURGEON TO THE ROYAL NORTHERN HOSPITAL, LONDON; SURGEON TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET; CONSULTING ORTHOPÆDIST TO THE LONDON COUNTY COUNCIL

This new instrument enables the surgeon to insert a Smith-Petersen nail through a small incision over the great trochanter without the use of wires and without exposure of the fractured neck of the femur. It is an instrument of precision and its setting in each case is determined by X ray photography in two planes of a part of the apparatus (the guide nail) which is first driven into the great trochanter.

This nail relates the apparatus to the bone and becomes temporarily a part of it. Direct measurements are made on the X ray film and subsequently transferred to the apparatus, which is not fixed to the operating table, and is consequently independent of horizon, spirit levels, degrees of internal rotation, or anteversion. The instrument was first made to take Kirschner wires, but it has now been improved so that wires are entirely eliminated from the whole operation.

The guide nail is used as a means of obtaining an exact setting of the instrument for inserting a Smith-Petersen triradiate nail in any direction which the operator desires. It allows sufficiently fine adjustment to aim the nail exactly where it is wanted.

The apparatus, which can be used for either lower limb, is made of stainless steel and consists of a rectangular guide nail 16·0 by 1·0 by 0·5 cm., with a reduced fluted end. A Duralumin tube is connected to this by two sliding arms at right angles to one another and graduated in centimetres. This tube is of such a size that a Smith-Petersen triradiate nail will slide down it and continue on a set course into the bone. In addition to the linear adjustments there are two quadrants marked in degrees whereby the angle of the duralumin tube can be varied in two planes at right angles to one another.

The guide nail is perforated at intervals of 1·0 cm. in two planes; these perforations are visible on the radiograms and provide a standard unit of measurement nearly independent of X ray distortion.

The X ray apparatus should be "shock-proof" and ether anæsthesia avoided. It is probably also a wise precaution to "earth" both the operating table and the X ray apparatus.

Insertion of the guide nail.—The fracture is reduced on an extension table and held fast in the abducted and internally rotated position. The guide nail is then hammered through a stab incision into the surface of the great trochanter at a point about 2·0 cm. below its tip (i.e., towards the feet) and near the middle of its lateral surface. The nail should penetrate the bone far enough to get a firm grip and so avoid all risk of subsequent wobble or rotation. A dip-stick rod is passed alongside the nail to the surface of the bone to measure bone penetration which should be approximately 2·5 cm. In the usual operative position of the limb for reduction of these fractures the nail must be directed approximately at right angles to the general line of the trunk and must be so held that two of its four surfaces look directly up and down — i.e., towards the ceiling and floor of the operating room.

Radiograms are now taken in two planes at right angles to one another, and if reduction of the fracture is satisfactory the appropriate setting for the instrument is worked out as follows.

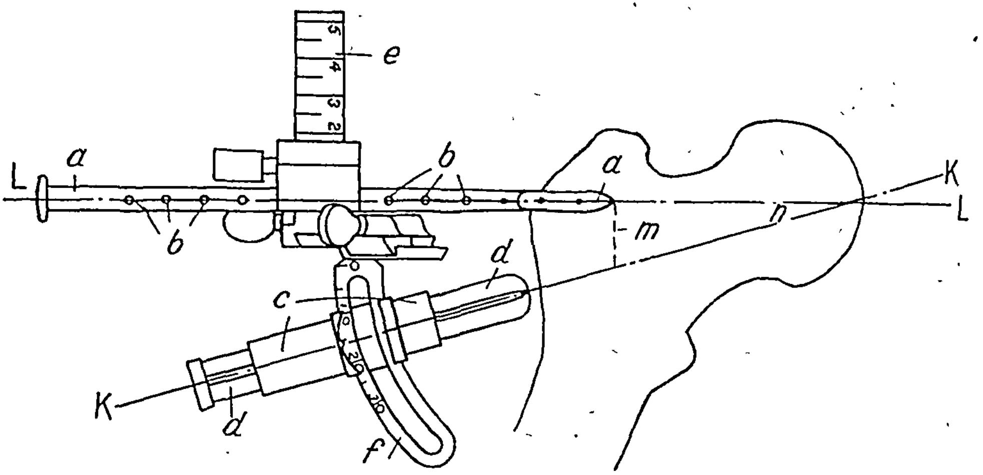


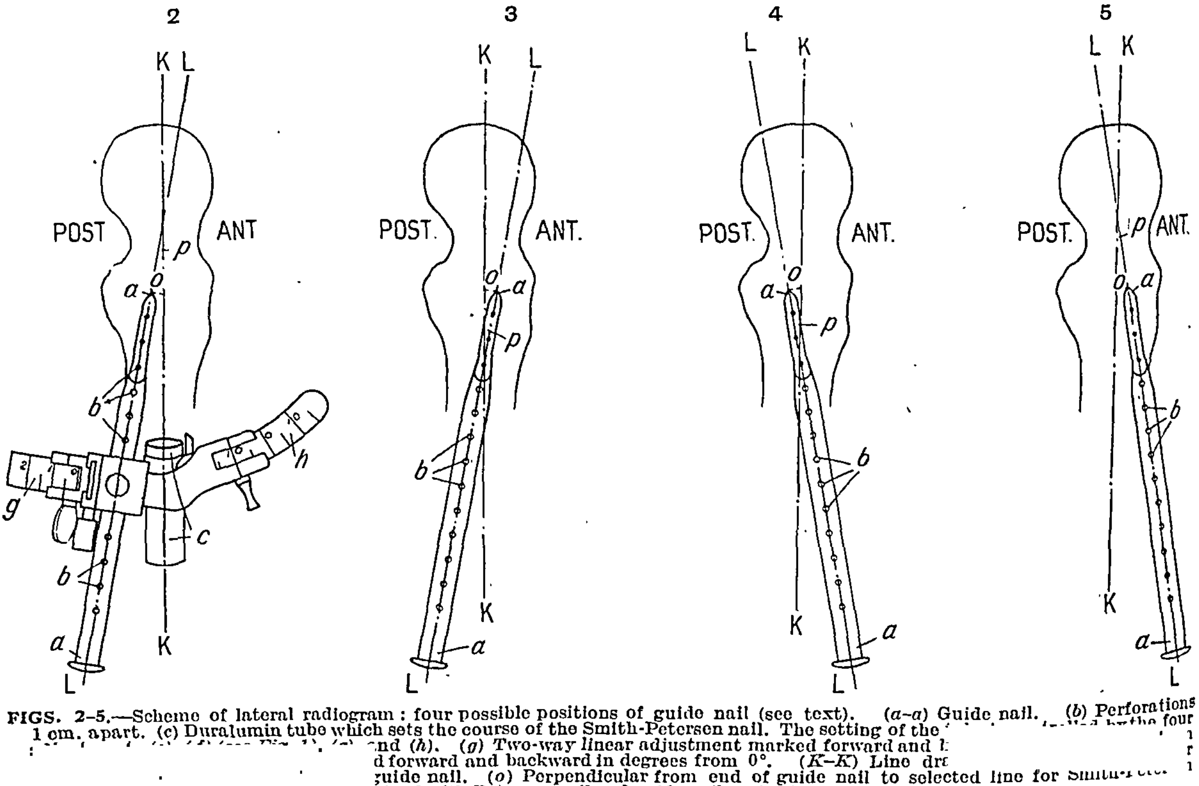
FIG. 1.—Scheme of antero-posterior radiogram with director and Smith-Petersen nail in position. (*a–a*) Guide nail. (*b*) Perforations 1 cm. apart. (*c*) Duralumin tube which sets the course of the Smith-Petersen nail. The setting of the tube is controlled by the four adjustments (*e*), (*f*), (*g*), and (*h*) (see Fig. 2). (*d*) Smith-Petersen triradiate nail in duralumin tube. (*e*) *One-way linear adjustment marked in centimetres.* (*f*) *One-way quadrant marked in degrees from 5°.* (*K–K*) Selected line for Smith-Petersen nail. (*L–L*) Projection of line of guide nail. (*m*) Perpendicular from end of guide nail to selected line for Smith-Petersen nail. (*n*) Angle between selected line for Smith-Petersen nail and projection of guide nail.

Calculating the setting of the instrument.—The surgeon has before him two wet films showing the fracture satisfactorily reduced and showing also the guide nail penetrating the great trochanter. The first of these films (Fig. 1) is the ordinary antero-posterior and the second (Figs. 2, 3, 4, 5) is a lateral of the neck of the femur which is really an infero-internal–supero-external view.

The antero-posterior film is held to the light and a straight line (Fig. 1, *K–K*) is drawn upon it where the operator wishes to place the triradiate nail. The guide nail is then projected on the X ray film (Fig. 1, *L–L*) until it meets this, and a line (*Fig. 1, m*) is drawn at right angles to the guide nail from its point to meet the line (Fig. 1, *K–K*) selected for the Smith-Petersen nail. The length of this perpendicular in centimetres is obtained by comparison with the photographed perforations in the guide nail which are known to be 1 cm. apart. This figure gives the downward (towards the feet) adjustment necessary on the linear scale (*e*). In order to obtain the correct setting for the quadrant (*f*) it is only necessary to measure the angle (Fig. 1, *n*) between these two lines *L–L* and *K–K*.

The lateral X ray film (Fig. 2) is then examined and the same two measurements obtained—viz., correct settings for the linear scale (*g*) in centimetres and for the quadrant (*h*) in degrees.

There is a difference between the two sets of



FIGS. 2–5.—Scheme of lateral radiogram : four possible positions of guide nail (see text). (*a–a*) Guide nail. (*b*) Perforations 1 cm. apart. (*c*) Duralumin tube which sets the course of the Smith-Petersen nail. The setting of the [illegible] four [illegible] and (*h*). (*g*) *Two-way linear adjustment marked forward and* [illegible] d forward and backward in degrees from 0°. (*K–K*) Line dr[illegible] guide nail. (*o*) Perpendicular from end of guide nail to selected line for Smith-Peter[illegible] for Smith-Petersen nail and guide nail projection.

readings inasmuch as the first two adjustments can only be made in one direction, and the second pair can each be made in one of two directions. This is because an essential step in the introduction of the guide nail is to insert it into the trochanter above the point at which the Smith-Petersen nail is to enter and in such a way that it makes an acute angle with the line of the neck of the femur. This is perfectly simple if the instructions already given under "insertion of the guide nail" are followed. To put the matter in another way, the two adjustments obtained from the lateral X ray photograph can be made on either side of the zero mark, but the apparatus is so constructed that zero in the coronal plane is at one end of the scale and adjustments are only possible in one direction, beginning at 1 cm., on the linear scale (*e*) and 5° on the quadrant (*f*).

It is therefore important to mark the lateral X ray photograph in order to avoid any possibility of confusion between the anterior and posterior surfaces of the femur.

Fig. 1 illustrates the setting of the instrument obtained from the antero-posterior X ray photograph—e.g., 1·8 cm. (Fig. 1, *m*) 16° (Fig. 1, *n*).

Figs. 2, 3, 4, and 5 show four possible positions in the lateral X ray photograph. The readings in each of these examples should be as follows:—

From Fig. 2 ..	0·5 cm. forward (0);	10° forward (p.).
From Fig. 3 ..	0·5 cm. backward (0);	10° forward (p.).
From Fig. 4 ..	0·5 cm. forward (0);	10° backward (p.).
From Fig. 5 ..	0·5 cm. backward (0);	10° backward (p.).

These adjustments are made on the instrument as it is slid into position on the guide nail.

Choosing the nail.—It is important to use a nail of the right length. My set at present consists of seven nails varying in length from 10 cm. to 7 cm., with 0·5 cm. difference between each consecutive pair. The length is that of the nail, excluding the head, since that does not enter the bone. The length of each nail is engraved on the outer side of the head.

The line drawn on the antero-posterior radiogram to represent the path of the triradiate nail is now measured in terms of the photographed perforations on the guide nail and the correct length of nail thus ascertained. The selected nail should as a general rule be a little shorter than the calculated length, otherwise it may partly emerge from the hemispherical head of the femur which is only shown in outline on the X ray film. In subcapital fractures it may be necessary to deduct for operative impaction and to add for nail obliquity, but in the transcervical group this is probably unnecessary because the greater size of the proximal fragment gives a greater margin of safety.

The nail starter.—A special nail starter is used to start a track for the Smith-Petersen nail which might otherwise be deflected from the correct course by one of its three fins encountering bone before the other two. A 3 cm. incision is now made in the long axis of the limb through the correctly adjusted duralumin tube; the starter is passed through the tube and tapped into the bone for about 4 mm and then removed.

The insertion of the nail.—The selected nail is then passed down the duralumin tube and tapped into the bone with a hammer and punch. When it is estimated to have entered the bone for about 3 cm. fresh antero-posterior and lateral radiograms are taken to check the procedure and the nail is then hammered home. The apparatus is now removed, the extension released, and the fracture impacted by a few heavy blows on the great trochanter with an impactor of Smith-Petersen's type. Final X ray photographs are taken and the wound is then closed in two layers (generally without drainage) and dressings applied.

NOTE

Certain relevant matters have been purposely omitted from this paper which it is hoped to supplement later. Amongst these important points are the following: (1) Results obtained by the method. (2) Choice of anæsthetic. (3) X ray technique. (4) Experience with a large nail instead of the usual 13 mm. diameter. The accuracy of the director makes this quite feasible but the large nail has been used on one occasion only. The standard size of Smith-Petersen triradiate nail has been used in all the other operations.

The brotherhood of medicine knows no boundaries, and I gladly own my debt to the writings of Smith-Petersen of Boston, Böhler of Vienna, King of Melbourne, Brocq and Dulot of Paris, and Burns of London, but above all to Sven Johansson of Gothenburg, whose admirable work on "Collum Femoris Fractures" has set a new standard of achievement in these difficult cases.

This instrument has been made to my requirements by the Medical Supply Association of 167, Gray's Inn-road, London, W.C.1, and I wish to acknowledge the help of the managing director, Dr. G. E. Greville, and his assistant, Mr. F. C. Hickman, as well as that of the radiographic staff of more than one hospital.

Clinical and Laboratory Notes

AN UNUSUAL INFECTION OF THE ANTRUM, OF DENTAL ORIGIN

By E. C. N. Strong, F.R.C.S. Eng., L.D.S.
EAR AND THROAT SURGEON, BIRMINGHAM MUNICIPAL HOSPITALS; AND

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RADIOLOGIST, SELLY OAK HOSPITAL, BIRMINGHAM

(WITH ILLUSTRATIONS ON PLATE)

A boy, aged 15, was admitted to the Selly Oak Hospital on March 5th, 1935, with symptoms of nasal sinusitis over a period of twelve months. They were said to have started soon after an attack of toothache in the left central upper tooth.

On admission he had pus in the middle meatus of his nose of the left side, the right being practically clear. On transillumination the left antrum was dim; radiographic investigation (Fig. I. on Plate) showed definite abnormality in this antrum. It was decided, on account of posterior nasal discharge, to wash out his sinuses by the Watson-Williams method. This was done, with the result that mucus only was found in both ethmoids; the right antrum was clean and the left contained pus, which on culture grew streptococci. There was no indication in his nose of any other pathological condition, except that localised in his left antrum. Five days after this was done he complained of pain in the left side of his face, which was slightly swollen. Nasal examination was negative, but he had a tender left upper central, which contained a temporary filling, said to have been put in six months previously. This tooth was painful and was loose; it was therefore decided to extract this, as the condition was a dental one. On examination of the tooth it was found that the root-filling material had passed through the apex into the alveolus, and was surrounded by an area of granulation tissue (Fig. II.). Radiological evidence indicated that the tooth pulp had been removed, and that a radio-opaque substance had been put in as a root-filling, clearly passing through the apex. In view of this latter condition, an occlusal film was taken (Fig. III.), which showed an area of rarefied bone spreading up into the floor of the antrum of the same side. After this tooth had been extracted the condition subsided, and subsequent lavage of the antrum proved clear. The patient left hospital on March 26th with no further symptoms.

This case is put forward for two reasons: firstly, it is suggested that the condition was an antral suppuration of dental origin, arising from a central incisor (an unusual occurrence); secondly, that undoubtedly the apex of this tooth was septic and was root-filled. Whether the root-filling had, in passing through the apex, spread the infection, or whether there was a pre-existing antral infection before the dental treatment, is open to doubt, but events after treatment show that the two were correlated, and it was, in fact, a direct extension from the tooth socket to the antrum floor. The fact that the ethmoidal cells of the same side were devoid of any pathological condition also suggests that the antrum infection was of dental origin. Normally, it is very common to find an ethmoiditis and an antritis, the usual sequelæ of a primary nasal pansinusitis.

The floor of the maxillary sinus is formed by the alveolar process of the maxilla, the thickness of the floor depending upon the degree of hollowing-out of this process. Where this hollowing-out is very pronounced, the floor must bear an important relation to some of the teeth and their sockets, and may even contain irregular elevations corresponding to the roots of the teeth. Such relationship depends upon the thickness of the layer of spongy bone, which varies much in different skulls, and even on the two sides of the same skull. Bony septa, varying in height and thickness and dividing the floor into pockets, often traverse the floor of the sinus; since the maxillary sinus varies greatly in size, and even on the two sides of the same skull, it is obvious that the relation of the teeth to the sinus can never be exactly constant. When the layer of spongy bone along the floor of the sinus is thin—i.e., when the maxilla is markedly hollowed out—the floor is at a lower level than the floor of the nose; if the alveolar process is comparatively thick, the floor of the nose is at a lower level than the floor of the sinus. Resschreiter states that it is a male characteristic for the sinus floor to be inferior to the nasal floor, but other observers have been unable to verify this observation.

In general terms the maxillary sinus varies greatly in size, shape, and positions, not only in different individuals, but in each side of the same individual; it does not attain its maximum size until the third decade of life, and thereafter appears to remain stationary. The base of the sinus is extremely variable, and no definite information as to its constant size and shape can be given. It is therefore obvious that when a radiographic study of the canine and bicuspid teeth has to be made, with reference to the maxillary sinus, it is essential that the floor of the sinus should be clearly delineated. Our experience has been that this can only be satisfactorily carried out with the patient in the upright position. Frequently stereoscopic examination is extremely helpful.

The teeth most often involved in antral sepsis are the molars and bicuspids, but it is possible that the canine and also, as is shown, the central, can be the cause of sepsis in this sinus; this is almost entirely due to the anatomical configuration of its outer and front wall. In this case the inflammatory condition is liable to spread towards the ascending process of the superior maxilla, rather than to run along the cancellous tissue of the antral floor.

We are indebted to Dr. S. Robinson, pathologist to Selly Oak Hospital, for her investigation of the bacteriology of this case.

FATAL POISONING CAUSED BY MORPHINE IN A PROPRIETARY REMEDY

By Arnold Renshaw, M.D. Lond., D.P.H.

DIRECTOR OF THE LABORATORY OF APPLIED PATHOLOGY AND PREVENTIVE MEDICINE, AND HON. PATHOLOGIST TO ANCOATS HOSPITAL, MANCHESTER

I HAVE never heard of an infant succumbing to a dose of morphine so small as that given in the following case.

The weight at birth was 6¼ lb. On Oct. 30th, 1934, when the child was eleven days old, the mother, in view of supposed constipation, gave it in the milk feed a few drops of a proprietary remedy called Cherub's Balm. On Nov. 1st, at 3 A.M., a further dose of one teaspoonful was given, after which the child cried for a time and then slept. It was still asleep when the family practitioner (Dr. H. Tomlinson) called in the morning, but the mother did not mention that medicine had been given. At 6 P.M. the mother asked the doctor to call again, but the child died at 8 o'clock without regaining consciousness.

Autopsy.—I carried out a post-mortem examination. The body showed lividity of the ears and the nails of fingers and toes, but no signs of violence. The pupils were not contracted but not fully dilated, measuring 4 mm. in diameter. Tardieu spots were found on the surface of the left ventricle at the junction of interventricular septum, with small ecchymoses (2–3 mm. in diameter on arch of aorta), fullness of the right auricle, and congestion of both lungs, with mucus in the trachea. The small intestine was congested for about 6 feet from the pylorus, and the thymus was large though not too large for the age of the infant. The meninges were intensely congested, particularly over the vault; the spinal canal and other organs appeared normal. About 2 c.cm. of urine was withdrawn from the bladder with a syringe and submitted to analysis, together with the stomach, stomach contents, duodenum with contents, small and large intestines with contents, liver, kidneys. I also sent for examination the spoon used to measure the dose administered, the bottle containing the rest of the Cherub's Balm, and three articles of clothing, and suggested that morphine be specially sought for. These analyses were carried out by Mr. G. D. Elsdon, Lancashire county analyst.

Histological examination.—Section of the lung shows congestion of blood-vessels and in places desquamation of the alveolar epithelium. There is no evidence of pneumonia or broncho-pneumonia to account for death, and there is no pleurisy. Section through one of the areas of discoloration in the heart shows a small extravasation of blood amongst the muscle-fibres, constituting the so-called Tardieu spot, met with in asphyxia. The muscle-fibres seem normal otherwise, though the strands of muscle are somewhat widely separated from each other. The meninges of the brain are congested but there is no evidence of pus-formation in the brain or on the meninges. The thymus is also congested, but otherwise normal. These findings would accord with death from asphyxia.

Chemical analysis.—The amount of Cherub's Balm in the bottle was 33 c.cm. (1 fluid ounce = 28·4 c.cm.) and the liquid has been found to contain 0·006 per cent. of anhydrous morphine. When full the bottle would contain about 43 c.cm., so that an amount not exceeding 10 c.cm. may have been removed. The volume of the spoon supplied is 2·5 c.cm. The quantity of anhydrous morphine in the liquid remaining in the bottle was 2 mg. (1 mg. = gr. 1/65). The amount in the bottle when full would be 2·6 mg., and the amount in one dose of the teaspoon used would be 0·15 mg. The stomach, stomach contents, and duodenum proved to be free from morphine. The kidneys and urine contained not more than 0·02 mg., and the liver about the same quantity; in the intestines and their contents there was about 0·1 mg. From these findings it was concluded that more than 0·15 mg. of morphine was administered, but that some of this had passed into the blood stream.

Cause of death.—At the inquest I gave my opinion that death was due to asphyxia not caused by mechanical violence, but by morphine poisoning. A verdict of death by misadventure was returned.

Cases have been reported in which quantities of the order 0·5 mg. morphine have resulted in the death of very young children. Thus E. Smith[1] describes a case in which opium gr. 1/20 (= 3·3 mg. opium=0·33 mg. morphine) caused the death of an infant 16 days old. A. and M. Winter Blyth[2] state that cases are recorded of infants dying from extremely small doses of opium—e.g., 0·7, 4·3, and 8·1 mg. (1/90, 1/15, and ⅛ of a grain)—but in such instances one cannot help suspecting some mistake. It may be conceded, they add, that a very small quantity might be fatal to infants, and that 3 mg. (0·3 mg. of morphine) given to a child under one year would probably produce serious symptoms.

In the present case it is to be noted that although the bottle when full would contain 2·6 mg. of anhydrous morphine, only 2 mg. was found left in the bottle. The dose however was given by candlelight, and the mother in evidence stated that she had knocked over the bottle and that some had escaped in this way. It can be assumed therefore that at least 0·15 mg. was administered but possibly less than 0·3 mg., of which 0·14 mg. was recovered from the stomach, duodenum, large and small intestines, liver, kidneys, and urine. In evidence at the inquest the manufacturer stated that he thought the medicine was safe and that he had heard of children drinking out of the bottle; he further stated that the morphine content was not ascertained by analysis. Accepting 0·5 mg. as a known lethal dose and 0·3 mg. or less as the dose given in this case, the bottle would contain 5–8 times the known minimum lethal dose. In view of the known idiosyncrasy of young children to morphine and the variable composition of syrup of poppies used in the medicine I offer the following suggestions.

1. All such preparations should be analysed for morphine content and a log book kept of all batches made and sold.
2. All such preparations should be sold only under Schedule 1 of the Poisons and Pharmacy Act, 1908, and the same description should be applied as is at present applicable under the Ireland Schedule (Part II.). Thus the present schedule exempts any preparation containing less than 0·2 per cent. morphine from Part I. of the schedule, whereas Part II. of the Ireland Schedule includes "Opium and all preparation of opium or poppies." Since the present medicine which contained only 0·006 per cent. morphine was able to cause death it is obviously possible for an unscrupulous person to encompass the death of an infant by the free use of preparations containing much less than the specified amount of morphine without any register of the sale of such a product being available.
3. The inspection of premises and records of all such manufactured products should be made possible by amending the Dangerous Drugs Acts, 1920, 1923, 1925, in such a way as to alter the amount of morphine from 0·2 per cent. to much less in amount before premises come within the purview of these Acts.

I am aware that this case may be an isolated one; on the other hand, others may not have been recognised, through suppression of information.

I wish to thank Mr. R. M. Barlow, the coroner, for permission to report these facts, and Mr. G. D. Elsdon for allowing me to give his chemical results.

A CASE OF LEOPARD BITE

WITH A NOTE ON CLAW MARKS

By James Walker, M.B. Glasg., D.P.H.
MEDICAL OFFICER, BEBIANIHA, GOLD COAST

On Jan. 7th, 1935, a Sefwi hunter was brought to the African hospital belonging to Bibiani (1927) Ltd. suffering from injuries inflicted by a leopard. Either by accident or bad shooting, he had hit the creature near the tail, so angering it that it turned on him and pulled him down, worrying him till two other hunters killed it. His left arm just above the wrist was bitten through, both bones being crushed. Both his arms were clawed extensively, and a fang had passed right through the inner side of the right orbital fossa to the floor of the skull, missing the eyeball. An unusual feature of the case was that a bite in the throat had pierced the trachea in such a manner as to leave a valve which caused air to be pumped into the tissues of the neck and face, producing conspicuous surgical emphysema. The patient was conscious, and his breathing obstructed and difficult; so I opened up the wound so far as was necessary to allow of easy respirations, and for some three hours he was comfortable. Then he announced he was going to die and did so.

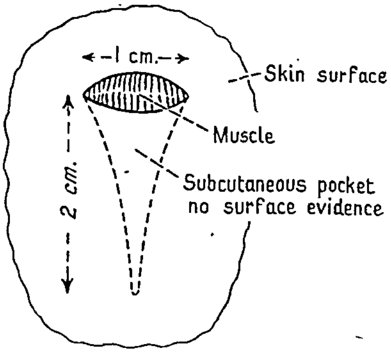

Diagram showing the gaping wound in the skin (through which muscle is visible), and the long subcutaneous pocket, not at first evident, made by the leopard's curved claw.

The accompanying diagram shows a type of claw mark seen on the right arm. These lesions were roughly half-moon-shaped and looked deceptively clean-cut and shallow, but in addition to the obvious wound there were conical pockets running well under what looked like sound skin, following the curves of the animal's claws. This multiple pocketing, if overlooked, would give every chance to the tetanus bacillus and other bacteria. It is caused by the animal *holding* the limb, without tearing it, and differs from the rending wounds.

The late Mr. H. Johnson.—The death of Mr. Harry Johnson, house governor and secretary of the Leicester Royal Infirmary on July 14th, is announced. Mr. Johnson had held this position for 31 years, and during his long service for the hospital had seen it expand from an institution with 226 beds to one with 486 beds and 92 convalescent beds. He was a member of the British Hospitals Association, and took an active part in the deliberations of the East Midland Regional branch.

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[1] Smith, E.: Amer. Jour. Med. Sci., 1854, liv., 381, quoted by Peterson, Haines, and Webster, Legal Medicine and Toxicology, 2nd edition, London and Philadelphia, vol. ii., p. 523.

[2] Blyth, A. W., and Blyth, M. W.: Poisons, their Effects and Detection, 5th edition, London, p. 294.

MEDICAL SOCIETIES

BRITISH SOCIAL HYGIENE COUNCIL

IMPERIAL CONGRESS

THE seventh Imperial Social Hygiene Congress was held at the London School of Hygiene and Tropical Medicine from July 8th to 12th, under the presidency of Sir BASIL BLACKETT.

The subject of the first discussion was recent efforts of the League of Nations in the fight against traffic in women. Mr. E. E. EKSTRAND opened the meeting with a paper reviewing the work of the League, which had, he said, definitely coördinated the efforts of the different countries. The League Council had come to the conclusion that the abolition of licensed houses was an essential step, but that it must be accompanied by careful measures of rehabilitation.

A number of speakers from various parts of the world contributed papers to another session on the welfare of the mercantile marine and social conditions in ports. Pre- and post-marriage problems and the best methods of teaching biology and hygiene were also discussed.

The two medical sessions dealt with the treatment of venereal disease at the present day, and with the relationship between yaws and syphilis.

Treatment of Venereal Disease

At the first of these discussions the chair was taken by Sir FARQUHAR BUZZARD and the opening paper was read by Col. L. W. HARRISON, who dealt with the recent advances in treatment and also the working of venereal disease schemes in England and Wales. Judging by the annual returns from the treatment centres, he said, no impression had been made on the incidence of gonorrhœa. On the other hand, it had never been believed that these figures really represented the number of cases in the general population; they reflected the popularity of the centres and the public appreciation of the seriousness of the disease. Far too few women were seen in the centres. More use, he thought, might be made of blood tests; the complement-fixation test for gonorrhœa had been made wonderfully sensitive and specific. A routine blood test would bring to light many cases not otherwise revealed. The most important advance in treatment had been the production of hyperpyrexia, the gonococcus being very sensitive to temperatures which could be tolerated by human tissues. Diathermy had provided a method of producing controlled temperatures which could be stopped at once if the patient were having too much. The usual routine was to enclose the patient's body in a Kettering hypertherm, through which conditioned air was pumped so that the temperature was kept between 106° and 107° for about six hours. Of 25 cases reported recently from the Mayo Clinic, 9 had been cured by one treatment, 4 by two treatments, and 3 by three treatments. It was important to recognise vaginitis due to the *Trichomonas vaginalis*, which might be mistaken for gonorrhœa and which seemed to be on the increase. It resisted all treatment except the application of Devegan. A similar condition might be found in the male urethra. Greater discrimination had been achieved in the soft chancre field. There were also some obstinate rectal inflammations, ranging from esthiomene to proctitis. It was important to apply skin tests at once to such cases. Intravenous Dmelcos was a useful form of treatment. If the condition did not yield to this and local applications, it was as well to think of granuloma inguinale and to give the specific antimony.

There had been a substantial and real decline in syphilis, and this disease was not being transmitted as freely as it used to be. The Ministry of Health Circular No. 1474 was a useful publication for all concerned with this work. The League of Nations had issued recommendations on the treatment of early syphilis which were likely to lead to a decided improvement. The recommendations had been based on an analysis of 13,000 patients in the primary and secondary stages. The treatment of merchant seamen who moved about from place to place was unsatisfactory, but the Office Internationale d'Hygiène publique were taking the matter up.

In the course of the subsequent discussion, the importance of taking rectal smears was urged; proctitis was often associated with vaginitis and no doubt accounted for many of the relapses. The head of the department of medical hygiene in Victoria (Dr. E. BRITTEN JONES) mentioned the fall in the number of cases of general paralysis of the insane in that State, and said that attention was being paid to the problem of mental deficiency in its relation to syphilis. He described a case of primary chancre of the lip treated by induced malaria alone, with apparent success. Mrs. A. E. WHEATEX (Adelaide) urged the establishment of an international dossier for every syphilitic treated, so that clinics to which he went subsequently could see exactly what had been done from the very first.

A report on the recent work of the Edinburgh venereal diseases clinic was submitted by Dr R. C. L. BATCHELOR. The Kline test had been studied; it seemed to be less reliable than the Wassermann in the earlier stages, but useful in assessing the result of treatment. He urged the establishment of a central bureau of information for malarial therapy. An attempt had been made to assess the influence of unemployment on the spread of venereal disease, but the sapping of physical and moral fibre seemed to be balanced by the organisation of clubs and other measures to help the unemployed. The measures designed to prevent ophthalmia neonatorum had not been completely successful, and practitioners, final-year students, and nurses might be circularised on the subject with advantage.

Major JEHAL SHAH (Bombay) submitted a paper on the treatment of acute gonococcal epididymitis, in which he emphasised the importance of adequate routine treatment to prevent resulting disability. The condition might be caused by the use of strong solutions or a reservoir placed too high when giving posterior irrigation for urethritis. Diathermy was of great value, and a few intramuscular injections of contramine at the proper time would facilitate results and minimise the risk of sterility. Daily intravenous injections of mercury cyanide and vaccines were also of great value.

Yaws and Syphilis

At the second medical session the chair was taken by Dr. HUGH STANNUS, who said that the problem of yaws and its relationship to syphilis was one of great magnitude. Most of those working in countries where yaws was common had little knowledge of syphilis, and vice versa, and as a result much confusion had arisen. Yaws was a far less serious affliction than syphilis: the primary sore was usually extragenital; the mucous membranes were not affected; itching was common and alopecia unknown. Yaws was never congenital, nor did it ever affect the eyes, viscera, nerves, or arterial systems. The conditions which favoured the spread of yaws and syphilis were not mutually exclusive. Yaws was a disease of the bush, and syphilis of the towns. Yaws did not protect from syphilis. In syphilis immunity appeared in six weeks; in yaws not for about six months.

Dr. P. H. MANSON-BAHR discussed the problem from the ecological standpoint. He did not adhere to the fixed idea that the two conditions were definitely separable. Anomalies of evolution were found throughout animal life, and were probably equally common among microbes. He suggested that yaws might represent a primitive form of syphilis among primitive people. With the advance of civilisation and clothing, contact inoculation became impossible, so that a strain of spirochæte evolved which could be conveyed by sexual contact. An analogy might be drawn with the relapsing fever spirochætes: organisms morphologically identical were transmitted through distinct arthropods to produce distinct clinical forms of the disease. In the tick-borne type there were marked neurotropic tendencies, which were not found in the louse-borne disease. The louse-borne forms seemed to be particularly amenable to salvarsan, to which the tick-borne types were resistant. There seemed no doubt that in the future it would be possible in the laboratory to convert one species of typhus virus into the other, and, if this could be done, there was no insuperable difficulty in the supposition that the spirochætes of yaws and syphilis might be interchangeable.

Major G. J. KEENE contributed his experience from Uganda, and said that there was much controversy and variety of opinion as to the differential diagnosis. It was important to know which was which, because of the great difference in treatment, in gravity of the disease, and in the cost of a large-scale campaign.

Social Hygiene in the Empire

In the course of the discussion on social hygiene problems within the Empire, papers were submitted by Dr. P. J. Kelly and Dr. B. E. Washburn respectively on the venereal disease problems of British Guiana and Jamaica. Dr. KELLY said that public opinion had definitely been aroused, but financial depression had held up schemes for treatment centres. In British Guiana, free treatment was confined to the principal clinic in Georgetown and subsidiary clinics at the county hospitals, but in the Windward Isles free treatment was available for all. The chief problems to be surmounted were ignorance, defaulters, continuous migrations in search of work, the prevalence of endemic yaws complicating statistics, and the great variety of races and cultures inhabiting the country. Dr. WASHBURN said that in Jamaica 10,600 patients had been treated during 1933 at the twenty public hospitals where free treatment was available. There was a regular scheme for health education and infant welfare. There was, however, no reliable information as to the incidence of venereal diseases in the island. Syphilis did not seem to be very prevalent. Many patients with gonorrhoea did not seek medical aid but, however widespread the disease was, it did not seem to cause crippling and serious trouble as it did in other places. Dr. L. J. Lemieux, adjutant-general for Quebec, presented a paper by Dr. A. S. DESLOGES on the provisions for dealing with venereal disease in the Province of Quebec. The educational campaign had, he said, resulted in a great increase of early cases, and an enormous amount of work was being done to combat syphilis and gonorrhoea.

The problem of the social worker in the venereal diseases clinic was discussed by Miss M. D. HEARN, assistant Lady almoner at St. Thomas's Hospital, at a session dealing with social services for women and children. The aim of the almoner, she said, was to establish friendly relations at the earliest possible moment, and many patients had told her that "they had not expected anyone to be kind to them in such a place." Many of the patients needed help in making readjustments to life. The diseases treated in these clinics had more social implications than any others, and an almoner was more urgently necessary than in any other department.

REVIEWS AND NOTICES OF BOOKS

Diseases of the Endocrine Glands

Third edition. By HERMANN ZONDEK, M.D. Berlin, Director of the Medical Division, Bikur Cholim Hospital, Jerusalem. London: Edward Arnold and Co. 1935. Pp. 492. 40*s*.

THE book is divided into two main parts. The first comprises a general survey of the functions of the endocrine system. Hormones are defined and their mode of action and inter-relationship explained. The physiology and chemistry of each hormonal gland is then studied separately; the comprehensive list of such glands including the thyroid, parathyroid, thymus, pituitary, sex glands, adrenal, pancreas, spleen, liver, hormones, pineal body, and carotid body; the so-called cardiac and circulatory are also discussed. The relationship between the hormones and vitamins, vegetative and central nervous systems, provide further chapters, and Part 1 of the book finishes with methods for the examination of patients for endocrine diseases. Part 2 is confined to a study of diseases or clinical entities associated with endocrine imbalance and each disease is treated separately. There are 22 chapters on Graves' disease, myxœdema, tetany, obesity, gigantism, dwarfism, osteitis fibrosa, hyperinsulinism, and so forth; in respect of each disease pathogenesis, etiology, symptomatology, and treatment receive full attention. A complete bibliography is given at the end and the references are grouped under the various chapters. Many illustrations, photographs, and charts further enhance the value of this work. Dr. Zondek has not tried to supply a compendium of physiological data, but rather to provide the clinician with a detailed study of the endocrine disorders. He has succeeded admirably. It is a stimulating work and deals impartially with old-established theories and recent views. Graves' disease is studied very fully, in exceptional detail. Dr. Zondek's work on this subject is already well-known; he has permitted himself to make certain definite statements on matters which are highly controversial—for example, that toxic cases without goitre respond better to potassium iodide alone than to Lugol's solution, and that digitalis does no good and may do definite harm to the heart in Graves' disease.

No small share of the credit for the production of this excellent book is due to the translator Dr. Carl Prausnitz.

Principles and Practice of Urology

By FRANK HINMAN, M.D., Clinical Professor of Urology, University of California Medical School. London and Philadelphia: W. B. Saunders Co., Ltd. 1935. Pp. 1111. 45*s.*

THE output of urological text-books by American authors continues; at least one new one seems to appear every year. In the preface to this latest addition to the American urological library an explanation of the multiplicity of American works on this subject is given. According to Prof. Hinman at least 40 per cent. of American medical graduates become specialists and another 40 per cent. of those who enter general practice give particular attention to one branch of medicine; since urology has now become an important specialty a large number of American practitioners are whole-hearted or half-hearted urologists.

Hinman's text-book differs in many respects from its predecessors, more especially in the prominence given to comparative anatomy, physiology, and pathology. The reason for his preoccupation with these subjects is the author's conviction that "the fundamental principles of urogenital practice are based primarily on anatomical conditions," and therefore can only be understood by one with an accurate knowledge of anatomy, including under this heading comparative anatomy and embryology. Unfortunately this attitude has involved the sacrifice of other matter of even greater importance to the practising urologist. After all, it is on the skill of his treatment that his success will depend, and in this work practical details of treatment have been badly scamped. It is of far greater importance to a surgeon to learn when a nephrectomy must be carried out and the best method of doing it, than to have a theoretical knowledge of the excretory apparatus of the fish. The paucity of space given to treatment is the more regrettable since the author is well known in the world of clinical urology and is one whose opinion on matters of practical importance would carry considerable weight. Even when these opinions run counter to those held by most experts they are stamped to carry the weight of wide practical experience. In spite of the shortcomings noted, this work contains a vast amount of interesting material, and provides a valuable supplement to other books of a more practical nature.

Krebs und Vererbung

By Prof. Dr. HANS R. SCHINZ and Dr. FRANZ BUSCHKE (Zürich). Leipzig: Georg Thieme. 1935. Pp. 280. R.M.21.

IN this book the authors have collected the numerous observations, scattered throughout the literature, which bear on the hereditary factors in cancer. They approach the subject from the point of view formulated by one of them (H. R. Schinz) in 1928 that cancer is a somatic mutation. The book begins therefore with a brief account of the gene theory of inheritance, which applies to mutations occurring in the germ-cells. The genetics of the incidence of tumours in such animals as drosophila, the mouse and the rat, and in man are then discussed. This section is followed by one on genetic factors determining the transplantability of tumours. The authors then deal with the experimental production of malignant tumours in animals and with the corresponding clinical phenomenon, occupational cancer in man, and they discuss the interaction of the two factors which determine the onset of cancer—namely, the extrinsic factor of chronic stimulation and the intrinsic factor of the genetic constitution. In this section reference is made to the filtrable fowl tumours. They do not readily fit into the picture of cancer as a somatic mutation, and these tumours are dismissed briefly in a page and a half by the suggestion that the filtrable agent is not a virus but a chemical substance. But even if one accepts that view it would have been of interest to know the arguments which would support the conception of chemical substances capable of producing in somatic cells immediately and without fail different specific mutations, all of which have in common that they confer upon the somatic cell the property of malignancy.

The least satisfactory part of the book are the statistical considerations of the incidence of cancer in man, which are based on the cancer mortality in the town of Zürich. A town of 250,000 inhabitants with a total cancer mortality of only 400 persons per annum can hardly yield suitable statistical material on which to discuss the incidence of cancer. The fact that the cancer mortality increases with age was surely known before 1932 when Schinz and Senti demonstrated this phenomenon also for Zürich. In speaking of an age disposition for cancer the authors do not even consider the view now held by many students of the cancer problem that the increase in the incidence of cancer with increasing age is not due to a special disposition of the aged organism for the development of malignancy, but rather to the long period of time necessary to induce cancer. No reference is made to the extensive work of von Pirquet where differences in the age-incidence of the various organs are discussed.

These are minor blemishes. Not only does the book contain a mass of interesting observations, but these have been well and clearly arranged and they are illustrated by 160 well-reproduced figures and diagrams, and there is a bibliography of 20 pages. If the book converts many readers to the view that cancer is a somatic mutation, it will also convince them that this conception is very far from being a short cut to the solution of the cancer problem.

A Manual of the Practice of Medicine

Thirteenth edition. By A. A. STEVENS, M.D., formerly Professor of Applied Therapeutics in the University of Pennsylvania. London: W. B. Saunders Co., Ltd. 1934. Pp. 685. 16*s.*

Stevens's Manual of Medicine is well known and popular in this country. His new edition appears six years after the last, and has additions which bring it fully up to date. For so small a book it is indeed remarkably complete, and though it makes no pretence to be more than a student's handbook, it must be regarded as an unusually comprehensive one. Stevens's medicine has certain advantages not always shared by the smaller text-books of medicine. The student who reads it well is less likely to put the rare causes first and to lose his sense of proportion, or to deprecate the importance of clinical observation than one who pins his faith to some of the other manuals, and he may even be inspired to seek fuller knowledge from another source. It is almost impossible for a teacher to express his personality in such a book as this, but so far as this can be done, Dr. Stevens has succeeded. His style is clear and concise; the arrangement of the book is good and the cross-references accurate; the index might perhaps be a little fuller. Treatment is given a prominent place, and a large number of prescriptions are included. This little book will continue to be welcomed by the student, and need not be despised by those who have satisfied the examiners.

Health, and a Changing Civilisation

By E. Obermer, M.D. London: John Lane, The Bodley Head, Ltd. 1935. Pp. 171. 3*s.* 6*d.*

This book is written for the general public, but it is very largely about the present form of medical practice, its preoccupation with disease and its failure, so far, to apply physiological knowledge to the promotion of individual health. The author holds that the human race has not adapted itself to a rapidly changing civilisation, and that the individual man is therefore less healthy than he was. It cannot be said that he attempts to prove this basic contention, but he finds its physiological explanation in imbalance of the neuro-endocrine-circulatory system. Changes in medical education, medical practice, and the public attitude to medicine are advocated, and a plan for an individual health service is outlined. It is only fair to add that the author does not expect these changes to be brought about quickly, but he hardly seems to realise the extent to which the public health service—in his view an organisation merely for preventing disease—is ready to absorb and utilise such knowledge as is available for promoting vigorous health, and the extent to which it is ready to contribute to investigation in such matters. The book is written with enthusiasm, and expresses a point of view which is not uncommon among those younger members of the profession who are dissatisfied with present-day medicine.

Insomnia and other Disturbances of Sleep

By Emanuel Miller, M.A. Cantab., M.R.C.S., L.R.C.P., D.P.M., Psychiatrist, West End Hospital for Nervous Diseases; Physician, Institute of Medical Psychology; Hon. Director, East London Child Guidance Clinic. London: John Bale Sons and Danielsson Ltd. 1935. Pp. 88. 2*s.* 6*d.*

Dr. Miller handles his subject in a suggestive way. His keynote is the value of balance. He holds that in satisfactory living equilibrium is an essential factor, and that sleep and wakefulness are the positive and negative poles of such living. His views are certainly expressed with an understanding which the reader feels to be based on such an equilibrium, for he deals with insomnia sympathetically from the standpoint of the psychical and the physical, theory and practice, causation and treatment, in the short space of some eighty pages. An interesting feature is his reference to Mengazzini's theory of the activity of the endocrines in the production of sleep and waking and of the share which the vegetative nervous system may have in the disorders of sleep; he hints that these factors are often associated in the sleep disorders of childhood and may sometimes explain such difficult problems as enuresis and night terrors.

The discussion of insomnia in the absence of any physical cause, such as pain or disturbed digestion, is of real interest. Such disturbances seem to resolve themselves into the fears and preoccupations of an anxious mind, whether they become evident through the dream of the normal, the somnambulism of the neurotic, or the waking hallucination of the psychotic. From the chapters on treatment much useful information can be collected in terms of general measures, drugs in their varied forms and psychotherapeusis. An excellent little bibliography is appended.

Physical Chemistry

For Students of Biology and Medicine. Second edition. By David Ingersoll Hitchcock, Ph.D., Associate Professor of Physiology in the Yale University School of Medicine. Springfield, Ill.: Charles C. Thomas; London: Baillière, Tindall and Cox. 1934. Pp. 214. 12*s.* 6*d.*

This volume is a worthy addition to the long list of books which have been the outcome of the attempt to teach physical chemistry to medical students. In these books the preface usually contains a despairing allusion to the state of ignorance of the student, a hint that this makes the writer's task extremely hard, and a modest hope that success has been achieved. The book now under review covers the ground adequately and has the advantage of possessing a good bibliography. The subjects are treated in a fairly non-mathematical manner, but it is to be feared that the author has assumed in his readers more basic knowledge than the English medical student as yet possesses.

Medical Case-taking and Diagnosis

By A. J. Kohiyar, B.A. Bom., M.D. Lond., M.R.C.P. Lond., Hon. Physician, J.J. Hospital, Bombay; late Professor of Biology, Grant Medical College, Bombay. Bombay: The Medical Bulletin. 1935. Pp. 133.

This is a short manual in which the orthodox methods of history-taking and physical examination are simply and attractively set forth, and the accompanying incidental information about disease and its manifestations is sound, useful, and not overburdening. Although the author is writing ostensibly for Indian medical students, we find no special mention of tropical conditions except in one chapter on the differential diagnosis of fevers, and we are tempted to ask why this book should be offered in place of the standard English books. One reason may be that it is shorter and simpler. Another is that the author wishes to emphasise the importance of systematic physical examination by omitting altogether the laboratory methods. He leaves these —including even urine examination—to be dealt with elsewhere, and gives all his space to history-taking and the searching of the patient's body by the examiner's eyes and hands and ears. There is much to be said for this attitude: if the Indian student masters the methods here set forth he will have laid a good foundation.

Commonsense Dentistry (a National Necessity)

By Edward Samson, L.D.S., F.C.S., Honorary Dental Surgeon to the Royal Victoria and West Hants Hospital, Bournemouth. London: J. S. Cottrell and Co. 1935. Pp. 100. 7*s.* 6*d.*

This book consists of three chapters, two of which are alliteratively named the Caries Chaos and the Pyorrhoea Panic. Mr. Samson makes some shrewd and witty hits at the confusion which reigns with regard to the ætiology and prevention of caries and pyorrhœa. The first chapters in which Mr. Samson pours ridicule on the theories concerning caries and pyorrhœa are funny in places, though perhaps not quite so funny as they are intended to be. In the last chapter entitled Common-sense Dentistry, with a portentious sub-title, "the birth of a new idea," Mr. Samson purports to provide a remedy for the lack of precise knowledge as to how dental disease is caused. He seems to think that if the government instituted a national laboratory for investigating dental caries and pyorrhœa all would be well and that the problems of causation and prevention would be speedily solved. All that is required, according to him, is for the Minister of Health to appoint a committee which should consist of the Minister himself, his chief medical officer, a public dental surgeon, a practising dental surgeon, a member of the Medical Research Council, and a member of its subcommittee on dental disease, together with any dental surgeon or other person whom the committee thinks would be useful. This committee would investigate the various reputable (sic) theories, correlating them according to their class and probability as advised by their professional members, apparently the dental surgeons. It would also gather statistics and, as the result of its labours, produce a report containing a line of action for the tame scientists herded in a government laboratory of dental research, who would then proceed to make discoveries which would solve the knotty problems of how dental disease is caused and how it may be prevented. How easy it sounds!

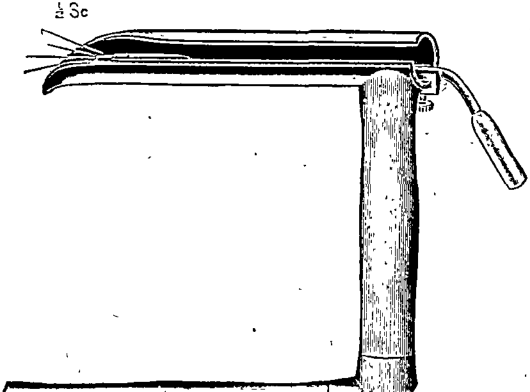
NEW INVENTIONS

ENDOTRACHEAL INSUFFLATION OF THE NEW-BORN

Messrs. Down Brothers, of London, have made for us the apparatus necessary for intratracheal insufflation of an O_2-CO_3 mixture in the treatment of asphyxia neonatorum as described in THE LANCET of March 30th, 1935 (p. 736).

The direct vision pharyngoscope illustrated (Fig. 1) is a modification of Howarth's Chevalier Jackson's instrument which has been designed for use in the new-born infant. The speculum is 10 cm. long, and its greatest outside diameter is 1·6 cm. The spatula is very short so that the soft palate does not obstruct the line of vision. The handle of the instrument is parallel to the speculum and joined to it by a shank 11 cm. long. This parallel handle gives better control than one set at a right angle to the speculum, and a shank of 11 cm. gives sufficient clearance between the handle and the chest wall during use. A wide infero-lateral slot runs the entire length of the speculum so that the pharyngoscope can easily be withdrawn without displacing the catheter when the latter has been introduced into the trachea. The illumination is by a lamp situated at the distal end, and the current is supplied by a battery enclosed in a separate wooden box with a variable resistance. In practice this arrangement of having a large separate battery has been found to be very satisfactory, since a dry cell purchased eighteen months ago is still in use by one of us.

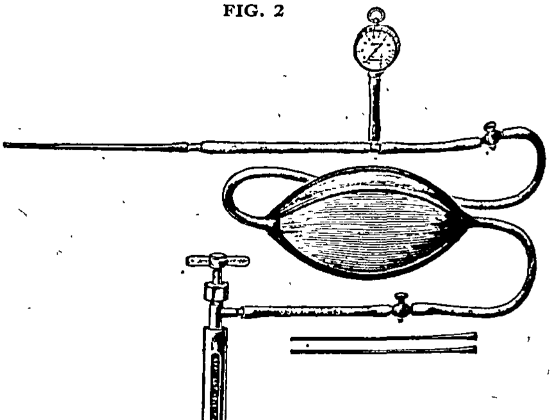
FIG. 1



The catheter used is a Magill's silk-web endotracheal catheter with a funnel-shaped end. Sizes 3, 4, and 5 give a suitable range. The choice between these sizes is determined by the size of the infant.

The apparatus (Fig. 2) for delivering the O_2-CO_2 mixture (90–95 per cent. O_2 and 5–10 per cent. CO_2) consists of a rubber bag of 3000 c.cm. capacity fitted at one pole with an inlet tube which can be connected to the supply of gas, and through which the bag can be filled. A tap on the inlet tube allows the bag to be disconnected from the supply of gas if necessary so that it can be kept in readiness in a convenient place, after having been filled. At the opposite pole of the bag is the outlet tube also furnished with a tap. This rubber tube is about 2 ft. long and terminates in a conical glass connexion which is easily connected to the funnel-shaped end of the endotracheal catheter after the latter has been introduced through the direct vision pharyngoscope. By means of a metal T-piece an aneroid manometer is attached to the outlet tube near its exit from the bag. This manometer has been specially made to register pressures within a range from 0 to 50 cm. of water.

FIG. 2



By compressing the bag with the hand the gas can be forced through the endotracheal catheter at any desired pressure, and any variations in pressure are immediately recorded on the manometer. The pressure required in the bag is usually 30–35 cm. of water, since this is sufficient to produce a pressure of about 15 cm. of water in the lungs themselves, provided a suitable size of catheter is chosen, depending upon the size of the infant. If necessary the bag can be continually refilled without interrupting the process of insufflation. The whole apparatus is compact and can be easily carried in the midwifery bag.

G. F. GIBBERD,
J. B. BLAIKLEY.

THE LANCET

LONDON: SATURDAY, JULY 20, 1935

ARTIFICIAL RESPIRATION ON THE SPOT

RESPIRATORY failure is the commonest mode of death, and artificial respiration is one of the three principal means of overcoming it, the others being inhalation therapy and the use of drugs. The method adopted may be either manual or mechanical, and the past few years have seen big advances in the evolution of apparatus designed to ventilate the lungs and to keep the respiratory mechanism working. The Drinker-Shaw respirator and the Bragg-Paul pulsator, for example, have both proved of great value where artificial respiration has to be maintained for very long periods; they have been used with success in Landry's paralysis and in the paralysis following poliomyelitis and diphtheria, as well as in cases of poisoning by carbon monoxide and by narcotics, and in cases of electrocution, apparent drowning, and asphyxia neonatorum. Complicated apparatus cannot, however, be applied rapidly outside hospital, and most of the accidents in which artificial respiration is urgently needed take place in the street, on the seashore, in the workshop, or in the power-house—that is, in places far removed from the most up-to-date instruments for expert medical treatment. Hence the proper use of manual methods is of first importance.

Of the many manual methods available, the two most popular are those of Silvester and Schäfer. Before SILVESTER brought his forward in 1858 those in use were crude and unsatisfactory. Thus H. W. RIVERS,[1] writing in 1845, says that—

> "the best mode of artificial respiration is by inflating the lungs from the breath of another person, or by means of a pair of bellows, . . . the pipe of which should be introduced into one nostril, and the other, as well as the mouth, should be closed. The bellows should then be put gently in motion until the lungs are inflated, which may be known by the breath's being fuller than when the operation was commenced."

And he goes on indignantly to point out that "the vulgar, inhuman and unphilosophical practice of rolling a party labouring under asphyxia, from drowning, on a barrel, or suspending him by the feet, needs only to be mentioned to be condemned." To-day, 90 years later, our outlook on the problem is or should be founded on a more scientific basis. In our present issue Dr. C. J. MIJNLIEFF sets forth four requirements which a manual method of artificial respiration must meet. First it should secure sufficient ventilation of the lungs; secondly, this ventilation should fulfil its primary purpose of facilitating exchanges of blood gases in the pulmonary circulation; thirdly, the nutrition of the heart must be promoted in order to maintain both the pulmonary and the systemic circulations; and finally, the application of the method must not injure the patient. With these requirements all will agree; but do they go far enough? We would add that any form of artificial respiration which is to be widely recommended should be easily learnt by unskilled workers and easily applied. Experimental work by various investigators shows that Silvester's method gives better ventilation of the lungs than those of Howard and Schäfer, since it aims at the rhythmical increase and decrease of the negative pressure in the thorax; and it is this negative pressure which brings about distension of the air cells and the blood-vessels surrounding them and helps to promote the blood flow in the pulmonary circulation. From the anatomical and experimental standpoint Dr. MIJNLIEFF is able to make out a good case for preferring it to that of Schäfer. It is well to bear in mind, however, that the forced expiration initiated in Schäfer's method brings in its wake a not inconsiderable negative pressure, due to the inherent resilience of the pulmonary tissues, the pleural membranes, and the thoracic wall. The state of equilibrium of the extensively distributed elastic tissue in the thorax is inconsistent with either forced inspiration or forced expiration.

At the fourth international Congrès de Sauvetage et de Secours held at Copenhagen last summer a number of manual methods were described and strongly advocated. On the whole English, American, and French medical opinion favoured Schäfer's, but the German and Dutch schools condemned it strongly and stood by Silvester's or its modifications. Prof. STEFAN JELLINEK[2] advanced an interesting method of his own.

> The patient is placed on his back with a pad between the shoulder-blades. The fingers of the patient's own hand are placed on his tongue, and fixed in position by a bandage round the wrist and neck. This manœuvre prevents the tongue from falling back over the glottis. The shoulders are then pushed down, or, as Jellinek says, folded back over the pad between the shoulders, and then allowed to return, to their original position. In this way the volume of the thorax is increased and decreased rhythmically.

He claims that this procedure is distinguished from all others by the fact that it is based solely on a folding action and not on compression or traction. His main objection to Schäfer's method is that, in experimental animals, compression of the chest brings about œdema of the lungs and brain. If in reply we argue that it is not always possible to infer from animal experiments that similar conditions would arise in man, this argument only lends force to JELLINEK's statement that research on life-saving and reanimation is not sufficiently widespread. The two main questions to be answered are: what method should be taught to first-aid workers and unskilled workmen who have to deal with an unconscious comrade, and what methods should medical practitioners be able to apply or supervise? It seems reasonable that the unskilled worker should be taught the simplest, but there is no need for the doctor to be limited in his choice. Schäfer's method is taught by the St. John Ambulance Association, which recommends Silvester's only when it is inexpedient or impracticable to turn the patient on to his face; and there does not seem to be sufficient reason why a method used with success by first-aid workers should be abandoned by them. But medical practitioners might be more eclectic. As Hederer[3] points out, cases of asphyxia fall roughly into three groups: (1) Asphyxia from drowning, in which the respiratory passages are partly or wholly obstructed by water or froth. Here, and wherever there is œdema of the lungs, Schäfer's method is probably the most useful, because the position of the patient and the compression of the chest help to empty the bronchial tubes. (2) Asphyxia from poisonous gases, in which the respiratory passages are often clear. Here the methods of Silvester or Jellinek might be used with advantage. (3) Syncope or "white asphyxia," in which there is some inhibition of the respiratory centres in the brain. Here the method which will probably give the best result is Silvester's or a modification of it, combined with rhythmical traction of the tongue.

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[1] Rivers, H. W., "Accidents—Popular Directions for Their Immediate Treatment," Baltimore, 1845. Quoted from The National Safety News, May, 1935, p. 20.

[2] Jellinek, S.: Bruxelles méd., Feb. 17th, 1935, p. 432.

In accidents due to electric shock it is observed that artificial respiration, started by the victim's associates, often stops as soon as a doctor arrives on the scene. Yet in these cases prolonged artificial respiration is the one essential form of treatment, even when signs of life are not obvious. In many factories resuscitation apparatus, consisting of a mask and cylinders of oxygen and carbon dioxide, is available, and when possible artificial respiration should be combined with the administration of this mixture of gases, which has a valuable stimulating effect on the respiratory centre. But with or without apparatus, artificial respiration must be maintained, and all things considered it seems that Schäfer's method will be the most appropriate variety. After clearing out the mouth and throat the first-aid worker can feel sure that this part of the air-passages will be free, whereas with Silvester's method the tongue has to be held up and the angle of the mandible pushed forward—small and important details which may be neglected by unskilled workers in the heat of the moment. Schäfer's method is easily taught and easily learnt and if it is performed carefully at a proper rhythm the patient will not be injured. But in cases of electric shock, whatever form of artificial respiration is adopted, it should be carried out by a team of workers for not less than eight hours, if automatic respiration has not previously been established. It is better to waste effort on a dead man than to lose a chance of bringing back a life which is only suspended.

URINARY INFECTION

There is now general agreement that the introduction of the ketogenic diet has greatly improved the prognosis of chronic urinary infection. In a recent critical review of 150 cases treated at the Mayo Clinic E. N. Cook and W. F. Braasch[1] say that this diet was successful in curing 85 per cent. of the uncomplicated cases. In the presence of any form of obstruction, however, the diet, while relieving symptoms, often failed to sterilise the urinary tract. This is only to be expected, since any obstruction to the outflow must lead to retention, and infection of the stagnant urine will follow almost inevitably. Unless the obstruction is removed the infection may persist despite any form of treatment. The importance of this factor and of a search for some underlying cause in every case of chronic urinary infection is emphasised by Prof. A. W. M. Ellis *on another page of this issue.* The cases described by him illustrate some of the forms of obstruction to the urinary outflow which may be found in chronic pyelitis; they also serve as an effective demonstration of the value of intravenous pyelography in routine investigation. It is noteworthy that the ketogenic diet is not equally lethal to all types of organisms found in urinary infections; it appears to be most useful in cases infected with coliform bacilli. These organisms, which account for approximately 80 per cent. of all urinary infections, can be subdivided by their biochemical reactions into two main groups: the *Escherichia coli* (*B. coli*) and the *Aerobacter aerogenes* (*B. lactis aerogenes*). Of 200 cultures of Gram-negative bacilli isolated from the urinary tract and studied by J. H. Hill and co-workers,[2] 100 were found to fall into the former group, while 79 belonged to the genus aerobacter. The two groups differ greatly in their resistance to drugs and also in their reaction to the ketogenic diet,[3] the aerogenes group being the more resistant.

The ketogenic diet as a practicable therapeutic measure has been justly criticised on the grounds that it is unpalatable, that it cannot always be tolerated, and that, since it requires the assistance of a skilled dietitian and a continuous and rigorous supervision of the patient, it is only suitable for treatment in a hospital or nursing-home. Clark and B. F. Keltz[4] have devised a simplified form of the diet, something on the plan of R. D. Lawrence's line rations for diabetics, which, they hope, may make it possible to treat coöperating patients in their own homes. But while some patients of education and fortitude living at home may and actually do adhere strictly even to the ketogenic diet now in use, it seems doubtful whether the ordinary out-patient will ever be persuaded to persist for 10 or 12 days without an occasional indiscretion with a diet which may be simpler to plan but is no more palatable. It must be remembered that even a single dose of a sweetened cathartic contains sufficient carbohydrate to upset the ketogenic-antiketogenic balance. CLARK and KELTZ hold that several short courses of dietary treatment are preferable to one long one and that whether or not the results have been satisfactory a mixed diet should be resumed after 12 days. Here again is a source of difficulty; it is mainly the hope of a more or less permanent cure without another course of treatment that induces patients to keep to the rules.

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[3] Hederer, C., quoted by Sillevaerts, C.: Ibid., 1934, xv., 131.

[1] Jour. of Urol., 1935, xxxiii., 583.

[2] Jour. of Bact., 1929, xvii., 205; Jour. Amer. Med. Assoc. 1935, civ., 1186.

[3] Clark, A. L.: Jour. of Urol., 1934, xxxi., 193.

[4] Jour. Amer. Med. Assoc., 1935, civ., 289.

Not long after the introduction of the ketogenic diet A. T. FULLER[5] showed that the effective agent in the urine of patients under treatment was one of the keto-acids, β-hydroxybutyric acid. This acid was found to exert a bactericidal action in vitro below pH 5·5, and it has since been shown that if the treatment is to be successful, a minimum concentration of 0·5 per cent. of the acid must be obtained in a urine of low pH. β-hydroxybutyric acid cannot normally be given by mouth to control urinary infections, since it is completely oxidised unless the patient is in a state of ketosis. It has been administered orally both by FULLER and LEONARD COLEBROOK[6] and by COOK and BRAASCH (loc. cit.) to reinforce the effect of a dietary ketosis. A few weeks ago we published a paper by Dr. M. L. ROSENHEIM[7] advocating the use of mandelic acid as a substitute for the ketogenic diet. This acid, like other organic acids allied to β-hydroxybutyric acid, was found not only to be bactericidal in vitro to coliform bacilli but to be non-toxic; but unlike many hydroxy-acids, after oral administration it was excreted unaltered in urine which was rendered bactericidal. Mandelic acid has been used with promising results in the treatment of a small series of cases of urinary infection at University College Hospital and is, we understand, receiving a more widespread trial. In order to obtain the effective concentration in the urine (0·5–1 per cent.), it is necessary to give the acid in large quantities (12 grammes a day). Since this dose may act as a mild renal irritant, a careful watch must be kept for any increase of albumin and for casts in the urine. Mandelic acid, like β-hydroxybutyric acid, is only active at a low pH and this can conveniently be produced by the simultaneous administration of ammonium chloride. Mandelic acid treatment evidently demands the same careful supervision of the patient as does the ketogenic diet. But those who have either had personal experience of this nauseating diet, or have acted as dictator to one who is confined to it will welcome the possibility of attaining equivalent results by the use of a drug not unpleasant to take. This new treatment is the logical outcome of the recognition of β-hydroxybutyric acid as the active agent in the urine of patients on the ketogenic diet, and we hope that further clinical experience will show that it can effectively replace dietary measures in the treatment of chronic infections of the urinary tract.

HERD IMMUNITY

THE experiments with mouse herds of W. W. C. TOPLEY and MAJOR GREENWOOD at the London School of Hygiene and Tropical Medicine are gradually lending precision to our understanding of epidemic and endemic events. In a paper read at the congress of the Royal Sanitary Institute at Bournemouth on July 16th, Prof. TOPLEY indicated some of the conclusions to which the work is pointing. He suggested the following definition of herd immunity: "The immunity of any herd in relation to any infective disease may be expressed inversely in terms of the rates of morbidity or mortality induced by the exposure of that herd to the risk of infection with the causative organism of the disease in question." Herd immunity may be of two types: (*a*) dependent upon the social or biological structure of the herd, being non-specific and due to conditions unfavourable to the transmission of infection; and (*b*) dependent upon the individual immunity (of some or all of the herd members) resulting from natural infection or from artificial immunisation. Such immunity is narrowly specific in its action. It is owing to the vulnerability to attack of the agents carrying the intestinal and insect-borne infections that a herd immunity of the former type has been acquired to such diseases as cholera, plague, and typhus. The droplet infections, on the other hand, are limited in their spread only by the immunity which individuals have acquired by clinical or subclinical reactions to them.

In the experiments of TOPLEY and GREENWOOD immunity of type (*a*) is eliminated, and the behaviour of infectious diseases is observed in a community of mice, more or less constant in population, of whom some of the initial group are deliberately infected and the casualties are replaced by susceptibles. It has been found possible to maintain such artificial centres of disease for several years, the rate of addition usually being three mice a day. The infections used are mouse typhoid, pasteurellosis—resembling pneumonic plague—and a virus disease, ectromelia. During the first few months of such an experiment there tend to be waves of mortality, but later the death-rate usually settles at a steady level if the rate of daily additions is sufficiently high. This state of affairs, artificially induced, indicates, it is suggested, that the epidemic process, when fully established under conditions which allow free spread of infection, has no inherent factor that imposes periodicity, or, indeed, any wave-like movements of mortality. The average expectation of life limited to 60 days in a healthy herd recruited at the same rate (three mice a day) is about 58 days. In herds infected with disease, new entrants have about half this normal expectation, falling to about a quarter or two-fifths at the end of 10 to 20 days, and then gradually improving until those that have survived for 50 days have 70 per cent., and those that have survived 100 days 80 per cent., of the normal expectation of life. The death-rate (the probability of dying within five days) rises rapidly to the twenty-fifth day of cage-age and then tails away. It is believed that the better resistance of the surviving mice is mainly acquired by sublethal infection and is not genetic in origin.

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[5] THE LANCET, 1933, i., 855.
[6] Ibid., 1933, ii., 735.
[7] Ibid., 1935, i., 1032.

"When an infected herd is formed," says Prof. Topley, "there is a rapid spread of infection, associated within a few weeks with a wave of mortality. The majority of the new entrants are infected soon after entry to the herd; half of them within a fortnight, 80 per cent. or more within a month. During the earlier stages of the epidemic the mice at risk are in part being killed by the prevailing disease, in part being immunised by sublethal infections. This early stage is marked by a widely fluctuating death-rate, or in some cases by separated waves of mortality. Later, as the total population increases, it becomes differentiated into sub-groups of varying cage-age, and consequently of varying resistance. Finally, a condition of equilibrium is attained, in which a steady average death-rate, derived from different death-rates operating on the different cage-age groups, combines with a steady rate of immigration to produce an invariant total population."

Topley and Greenwood have tried to influence this course of events by immunising mice before admission to the infected herds. In mouse typhoid the epidemic was not modified in its course, but the individual mice had a slightly improved expectation of life. With ectromelia, however, an attenuated virus had a much more striking effect. Immunised entrants artificially acquired as good a chance of survival as the old members of an infected herd and not much less than that of the normal uninfected.

Prof. Topley is cautious in applying these results to the practical problems of hygiene. They are in accord with the view that natural immunisation by clinical or subclinical infection, combined with the rate of accumulation of susceptibles in a community, is the most important single factor in determining the form of the endemic-epidemic prevalence of human disease which is provided with ample channels of natural spread. As regards artificial immunisation, they agree with the common experience that vaccination against a virus disease tends to be far more effective than vaccination against a bacterial disease of the invasive type; but no opportunity has been afforded for testing the effect of pre-immunisation against toxæmic types of bacterial disease like diphtheria and scarlet fever. The work on ectromelia at least supports the case for vaccination against small-pox (if any further scientific support was needed) and holds out hope that influenza may yet become controllable as the result of the work of Sir Patrick Laidlaw and his colleagues. Something is lacking in all antigens used for promoting immunity to the enteric group, and with Prof. H. Raistrick, Prof. Topley is attempting to find one which is more effective in mouse typhoid. As to the droplet infections, the fact that these appear to be insusceptible to any other method of control except pre-immunisation may bring disappointment to some, but should at least lead to much greater coöperation between public health departments and laboratories in carrying out field investigations.

ANNOTATIONS

DUFFERIN FUND JUBILEE REPORT

The Dufferin Fund, which has been selected as one of the four benevolent organisations in India to benefit by the Silver Jubilee Appeal, celebrates its own jubilee this year. The fiftieth annual report of this national association for supplying medical aid by women to the women of India describes the work for 1934 of the Dufferin Fund proper and includes that of the Women's Medical Service subsidised by the Government of India. The income of the former, though sadly diminished by the fall of interest on invested funds—succeeded in maintaining the usual twenty-seven scholarships to enable selected women medical students to study and qualify in 5 Indian universities, and in subsidising various women's hospitals in different provinces. The total number of women students taking the University courses was 367. There are also 593 women studying medicine in various medical schools throughout India. At the Lady Hardinge Medical College, New Delhi, 152 women students are in residence, drawn from 22 provinces and states and of 9 different races and religions. The course is spread over seven years, two of which are pre-medical. Nine members of the Women's Medical Service are deputed to this college as teaching staff and medical officers in charge of the various units of the hospital attached to the college. This hospital contains 220 beds and 56 cots; 4376 in-patients and 18,046 new out-patients were treated in 1934 and 2600 operations were performed; of these 215 were abdominal sections—59 being Cæsareans. The surgeon in charge of the surgical unit pleads for more radium in a form suitable to the treatment of carcinoma other than that of the uterus; the supplies at present available can only be used for this purpose. The reports of almost all the other 27 hospitals staffed by members of the Women's Medical Service form depressing reading.

Whilst most valuable medical work is clearly being done in these institutions, the difficulties with which the staff have to contend must be discouraging in the extreme: antiquated buildings and equipment, inadequate provision of absolute necessities, such as drugs, instruments, bed linen; poor housing conditions for an underpaid staff. Lack of funds is evidently hampering the work to an extent which would not be tolerated by public opinion in this country. There are now 41 full members of the Women's Medical Service, 21 of whom are of Indian domicile; 8 members are on probation and there is a reserve of 12 graduates of Indian universities in training. One development during the year under review is the appointment in London of a medical adviser to the United Kingdom branch of the Countess of Dufferin's Fund. Dr. Agnes Scott, who was chosen as the first holder of this office, is a former chief medical officer of the Women's Medical Service, can be consulted on Monday afternoons or Thursday mornings, at India House, Aldwych, where, through the courtesy of the High Commissioner for India, she has been given an office.

VITAMIN STANDARDS

AT the request of the Health Organisation of the League of Nations, the board of trustees of the United States Pharmacopœia have consented to make generally available the standard cod-liver oils prepared for use in the United States as secondary standards for vitamins A and D. The distribution of these oils will not be made through the national distributing centres, as in the case of the primary Vitamin Standards, but direct to individual users. They may be obtained from E. Fullerton Cook, Ph.M. (chairman of the Committee of Revision of the U.S. Pharmacopœia), 43rd Street and Woodland-avenue, Philadelphia, Pa., U.S.A. It should be clearly stated whether Vitamin A oil or Vitamin D oil is required. A charge of 2·50 dollars is made for containers holding 30 c.cm. A sum to cover the cost of the quantity required should be sent by international money order with the application. The oils will be sent post free to their destinations. These reference oils are checked each six months biologically against the International Standards by at least six laboratories and their potency should therefore be increasingly dependable.

ACTIVITIES AT THE COLLEGE OF SURGEONS

FIVE years ago the Royal College of Surgeons of England opened a few small laboratories for experimental surgery and allied problems in the college buildings at Lincoln's Inn-fields, London. Three years later a surgical research farm, the gift of Sir Buckston Browne, was opened at Downe, Kent. That the opportunities for research which were provided are not being neglected is well seen from a study of the annual report of the conservator of the museum and director of research, Dr. John Beattie, which has just been published. The subjects of investigation range from purely surgical problems—e.g., surgical shock, wound healing, nerve grafting, intestinal obstruction and peptic ulceration—to fundamental physiological problems concerning the nervous mechanisms involved in the control of visceral functions. On Feb. 2nd the contributions of two of the research workers on the development of surgical shock were reviewed in these columns, and it was then pointed out that investigations such as these provide the necessary basis for a proper treatment of shock. From this present report it appears that further progress has been made in an understanding of the nervous factors which are concerned in the production of the "shock" condition. As the result of another investigation a new treatment for achalasia of the cardia has been well established and proved its value in practice, though a proper assessment of the final results cannot yet be made. Another subject of inquiry has been intestinal obstruction, which still has too high a mortality even in the most experienced hands. Various theories have been advanced to explain this, but the experiments of two of the investigators at the college have demonstrated the presence of a toxic substance which is apparently responsible for the deaths of their animals, even when the strangulated loop was released at a time when it was still viable. The toxin is produced in the gut-wall and is liberated into the veins, lymphatics, and later into the peritoneal fluid. These results suggest that excision of a strangulated loop is a much more rational procedure than a simple release of the strangulation.

The recent development of surgical research at the college is going on parallel to a series of developments in the Hunterian Museum which will increase still further the value of the collections housed there. A new section of surgical anatomy is planned. This is to contain dissections illustrating operative approaches to every region of the body. It is pointed out that such a programme will take years to complete, but even in its early stages it is bound to be of the utmost value to every young surgeon and to most experienced operators. The pathological catalogue is to include photographs of the histological appearances of the specimens on the shelves, and microscopical slides are to be made available to students. These are much needed improvements and will be appreciated by every student who uses the collection. In time the college will become the possessor of a collection of type tumours with complete data on the case-history, operative and other treatment, histology and after-history Such a collection, properly indexed and documented, should be a national one available to every pathologist in the United Kingdom.

The council is to be congratulated on the encouragement it has given and continues to give to the forward movement in the various scientific departments at the college. It is apparent that these departments are worthy of better accommodation than they possess at present, and it is to be hoped that means will be found to carry out the scheme of expansion which is outlined in the present report.

STATISTICS OF NOCTURNAL ENURESIS

BED-WETTING is a common and troublesome problem for which despite innumerable theories of causation, and consequently of treatment, there is no certain cure. Not infrequently the habit will disappear at an early age for no obvious reason. This absence of any exact knowledge has led the Child Guidance Council, founded in 1927, to an attempt to replace generalizations by some carefully collected statistics, designed to ascertain whether in certain characteristics the enuretic child differs from the non-enuretic. Material was obtained from the case records of six Child Guidance Clinics in London, all the 1705 new cases attending the clinics in 1932 being chosen. Such cases are not, of course, representative of all children since they have been referred to a clinic because they are difficult or nervous but this selection, applies to both the enuretic and non-enuretic groups. The collection and analysis of this material has been carried out by Robina S. Addis.[1] Of the total 1705 children, she reports 18·4 per cent., or nearly one-fifth, were enuretics, the proportion amongst boys (20 per cent.) being slightly higher than the proportion amongst girls (16 per cent.). In age they are, on the average, significantly younger than the non-enuretics—which might support the popular belief that a child "grows out of" the symptom. The non-enuretics are referred to the clinics in increasing numbers up to fourteen years of age while the enuretics show their peak at 8–10 years and then decrease. Position in family shows no significance, but there is a slightly lower proportion of enuretics among only children than in families of two or more. Calculation of the intelligence quotients leads to very similar average values for the enuretic and non-enuretic groups but the latter show rather more variability and there are less enuretics at the two extremes of intelligence. Enuresis is found to be by no means an invariable symptom of feeble-mindedness, not even on the idiot level, for there were thirty-two children with I.Q.'s of 40 and 50 who were not enuretic and only two who were. This, besides suggesting that bladder control is not a function of the intelligence points, the author thinks, to the conclusion that the constitutional and psychological factors predominate. She suggests that from her figures it may be deduced that the enuretics fall into two groups, the one of *high*, the other of *low normal intelligence*, and that this is in keeping with clinical observation which has shown two main types with lack of bladder control—the slow and lethargic and the restless and anxious. In view of the relatively small number of enuretics involved in this inquiry the validity of this deduction appears very doubtful.

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[1] Archives of Disease in Childhood, June, 1935, p. 169.

INJURIES TO THE FACE AND JAW IN WARFARE

THE coöperation of the dental surgeon with the specialist in plastic surgery has greatly increased the possibility of successful treatment of wounds of the face and jaws. The patient's future often depends on whether mutilation is prevented and function restored, and wonderful as are the results of operations for the repair of wounds and deformities of long standing, it is still true that mistakes in the early stages of treatment may destroy the chance of satisfactory restitution. An Army advisory committee appointed to inquire into the facilities for the treatment of maxillo-facial injuries in modern conditions of warfare, has just issued its report to the Army Council,[1] and this lays emphasis on the importance of skilled dental treatment from the time the patient first enters the main dressing-station until he reaches the home hospital. A general hospital of 600 beds should, it is proposed, have one dental officer, one clerk orderly, and one dental mechanic, and a dental officer should also be detailed to every hospital ship whose voyage may last more than two or three days —all dental officers receiving a three months' course of training in the treatment of maxillo-facial injuries. Specialised surgery does not ordinarily come into the picture until the patient has reached the home hospital, but attention is drawn to points of importance in the first-aid and preliminary treatment. The danger of suffocation and of severe hæmorrhage may be largely overcome by correct posture, and by control of the tongue—a fact with which stretcher-bearers should be familiar. The prone position, with the head hanging over the end of the stretcher, is recommended. In the preliminary surgical treatment at the casualty clearing station, the surgeon is advised to use all possible care in suturing the torn skin and mucous membrane, so that raw ends of bones may be covered and skin and mucosa may be approximated at the margins of the wound; but all stitches must be inserted without tension. Submandibular drainage is advocated for injuries of the lower jaw, in view of the high incidence of abscess formation, and, to prevent adhesions obliterating the buccal sulci, the use of a piece of stout rubber tubing encircling the sulci is suggested. The dental surgeon is given two principles which should guide him in the early stages; one is that he should be as conservative as possible in dealing with loose fragments of bone and injured teeth; the second that he should attempt fixation of the fragments in accurate position. Interdental wiring is recommended, or, in the absence of teeth, splinting by means of unbroken dentures, or of gutta-percha moulded into the mouth. Anæsthesia is advised, since it is not thought likely that post-operative vomiting will give rise to suffocation where dental wiring has been used.

The committee believes "a special hospital reserved solely for the treatment of maxillo-facial injuries is preferable to special departments in general hospitals, provided that the number of cases justifies it." The treatment of these cases tends to be tedious, to extend over a long time, and to involve a succession of operations. The provision of an auxiliary hospital to which patients can be transferred in the intervals of active treatment is almost a necessity, but unity of control is essential. The plans for the special hospital have been based on those of Sidcup Hospital, designed as a maxillo-facial hospital during the late war, and it is felt that a suitable working unit is 200 beds, with a possible extension of the number to 500. On reaching the special hospital the patient is placed under the charge of the surgeon who is to carry out the final bone-grafting and plastic operations, but the coöperation of the dental surgeon is necessary from the outset, and, in cases not requiring plastic work, he may have complete control.

An appendix to the report contains the contrasting views of Mr. Warwick James and of Mr. Kelsey Fry on the relative values of interdental wiring and of metal-cap splinting in the fixation of fractures of the mandible and maxillæ. We have previously referred[2] to the arguments advanced by the adherents of the two methods. It is allowed that good results can be achieved by either procedure, though it can be argued that one or the other gives more certainty of success. The main points on which discussion centres are the rapidity with which satisfactory immobilisation can be effected; the amount of attention necessary afterwards (a vital consideration in the conditions of war); the possibility of keeping the mouth clean; and the prevention of interference by a non-coöperative patient. Although no conclusion was possible on the relative merits of wiring and splinting, the report gives a useful summary of the methods advised for fractures at particular sites and with various complications.

A RAPID SURVEY OF BIOLOGICAL PROBLEMS

THE form of a Platonic dialogue has been adopted in a stimulating general survey of biological problems which has recently appeared in a translation from the German.[3] A, the Socrates, is made to discourse for twenty-one successive evenings upon biological problems. B, the intelligent laymen thirsting for knowledge, hangs upon the lips of his teacher suggesting difficulties and asking questions, many of which the other is hard put to it to answer. Dr. Thesing has on the whole been extraordinarily successful in this method of presenting the subject—a method which in less skilful hands could easily become tedious. The field covered by the discussions is vast. From the origin of the world and of life we are brought into touch with most of the major problems confronting the various biological sciences. The origin of man, immunity, hormones, heredity, evolution, eugenics, ecology, and many other subjects are discussed in the light of modern research. Specialists in each subject could of course find several points of detail with which to disagree; on the whole these are not important, but in the section on development no mention is made of recent experimental work on the factors which determine the fate of cells in the embryo, and this constitutes a serious omission. It is refreshing after the dogmatism of many recent popular biological books to find a clear statement of the difficulties in the way of accepting in toto any one of the prevalent theories of evolution. The attitude adopted towards controversial questions is in fact singularly impartial, and it is interesting to note that this impartiality extends even to questions of racial biology.

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[1] Report to the Army Council of the Army Advisory Standing Committee on Maxillo-facial Injuries. H.M. Stationery Office. 1935. 6*d*. net. Postage extra.

[2] THE LANCET, 1935, i., 99.

[3] School of Biology. By Curt Thesing, M.D. Translated from the German by Eden and Cedar Paul. London: George Routledge and Sons, Ltd. 1935. Pp. 368. 15*s*.

THE COMMONWEALTH FUND

THE report of the Commonwealth Fund speaks modestly of its little gift (\$1,720,514·54) made to the British and American peoples during the year 1934. While others debate the burning issues of "medical economies" the Commonwealth Fund has concerned itself with attempting to raise the standards of medical service. One method of raising standards in rural communities is the establishment of the community hospital. Six rural hospitals have been sponsored by the fund as models of what a community hospital should be. All but one of the hospitals have shown increased occupancy in 1934 as compared with 1933 and their financial position is much stronger; earned cash receipts have gone up by 31 per cent., net indebtedness has been cut in half. An extensive demonstration of rural health work in Tennessee has had, as was intended, an educational value besides making a contribution to social welfare. Both in Mississipi and Massachusetts the Fund has aided in raising the standards of local health units; in the former State by sponsoring within the State health department travelling advisory and supervising units; in Massachusetts by promoting the formation of a model district health unit coördinating the efforts of sixteen towns in the south-western part of the State which previously had functioned as independent public health units. This demonstration should provide a much-needed lesson in the Eastern United States, for the old system of township units still has a devitalising grip upon public health administration even in such a progressive State as New York. In the Mountain State of New Mexico the Commonwealth Fund had for four years been helping to provide public health nurses in 15 out of the 31 counties. At the present time these nursing services, now established in the goodwill of the population, are deriving a large part of their support from local funds. To the north of New Mexico is Denver wherein is lodged the medical school of the University of Colorado. Here the Fund is supporting a significant study of normal child development. The study is being made of 100 Denver children and is under the general guidance of a pædiatrician. At suitable intervals, beginning a few weeks after birth, specially trained workers determine a record for each child: the most important bodily measurements; the development of the bones and muscles generally and posture; the development of the jaws and teeth (by plaster casts and X ray); the development of the head bones and sinuses and of the chest and heart (by X ray); the behaviour of the heart (by electrocardiograph); the basal metabolic rate; the mentality and general social adjustment. Each child is examined every quarter by a pædiatrician. Other studies are made in special groups of infants and children. The Child Research Council finds no lack of uncharted territory in the anatomy and physiology of the earlier years of human life.

Besides its medical and public health work the Fund provides fellowships to enable British university students "to spend two years as guests of the Fund in graduate study at American universities and in first-hand observation of American life." In the last ten years 260 such fellowships have been granted. Until his death last year Sir Walter Buchanan-Riddell was chairman of the committee of award; he has been succeeded by Sir Walter H. Moberly, whose academic associations put him in an excellent position to assess the claim of candidates. It is interesting that 40 per cent. of the returned fellows are now holding positions in British and Colonial schools, colleges, and universities.

AIR RAIDS AND POISON GAS

THE Home Office last week issued a circular[1] describing the precautionary measures to be taken for the protection of the public against attack by hostile aircraft. The Government feel they would be neglecting their duty to the civil population if they failed to take such precautions, since developments in the air have made it possible for attacks to be delivered—and delivered suddenly—on many parts of this country; but the circular states that "the need for these measures in no way implies a risk of war in the near future; nor does it imply any relaxation of effort on the part of His Majesty's Government to ensure the promotion and maintenance of peace by all the means in their power." The first step has been to establish an Air Raid Precautions Department at the Home Office and this will be directly responsible for central activities including the issue of warnings, the accumulation of gas respirators and protective clothing for certain air-raid services, the coördination of demands for hospital equipment, the storage of bleaching-powder for decontamination of gassed areas, and the issue of advice. The British Red Cross Society and the Order of St. John of Jerusalem are also to play their part, by the enrolment and training of emergency personnel, especially for medical and anti-gas services, and in the instruction of the public. The main responsibility, however, is to rest with the local authorities, which must arrange schemes for treatment of casualties, and the maintenance of all the essential services in their charge. These are briefly outlined in the circular, but fuller information for the authorities and the public will be given in a series of handbooks to be issued in due course. Meanwhile those interested in the subject can easily find other sources of information, both reassuring and otherwise. In the first category we have Mr. Davidson Pratt's recent lecture to the British Science Guild[2]; he thinks that the terrors of gas attacks have been much exaggerated, and believes that the civil population as a whole, if trained against panic, will find tolerable safety by staying in gas-proofed rooms in their own houses. The Union of Democratic Control, on the other hand, after reviewing[3] the incendiary and toxic agents available, quotes the conclusion of a commission of the International Red Cross (1928) that if the technique of offensive weapons continues to improve "the fatal moment must arrive in which the question of defence, already extremely difficult in view of the means already available, becomes an insoluble problem. A large proportion of the inhabitants of populated towns must be doomed to destruction." In these circumstances, it is suggested, the precautions proposed by Mr. Davidson Pratt and others cannot be taken at their face value, and the public should be fully informed of the facts, as summarised in the Union's pamphlet. By way of alternative, more technical details are obtainable, if desired, from the official "Manual of the Medical Aspects of Chemical Warfare" (1926) or, with later details, in a paper just issued by Dr. Bischoff[4] of Lugano, who describes the symptoms, signs, and treatment of various forms of gas-poisoning. Evidently the medical profession will soon be expected to enlarge its repertoire so as to be able to deal with these new man-made diseases. But like other pathological conditions they are more easily prevented (one would suppose) than cured.

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[1] Air Raid Precautions. London: H.M. Stationery Office. 1935. Pp. 8. 2*d*.

[2] Gas Defence. By J. Davidson Pratt, O.B.E., F.I.C. British Science Guild. 6, John-street, Adelphi, W.C.2. Pp. 18. 1*s*.

[3] Poison Gas. Published by Union of Democratic Control, 34, Victoria-street, S.W. Pp. 63. 6*d*.

THE EMPLOYMENT OF MARRIED MEDICAL WOMEN

THE general purposes committee of the L.C.C. have been considering representations received from various organisations with reference to the employment of married women; the object of the representations has been to secure that married women should be eligible for employment without restriction throughout the Council's service. The committee report that they have considered the question from the point of view of the public service and not in the interest of any category of the staff and have come to the conclusion that in two instances, those of the medical and teaching professions, material advantage to the public service would result if married women were eligible for service as officers of the Council. Their main reasons are that the duties of both doctor and teacher call for certain personal qualities which may be thought to be enriched by marriage, and that the training of women entering these professions involves in many cases considerable expenditure of public money, the fruits of which are lost to the community if the career of every woman is terminated by marriage. They propose, therefore, subject to certain limitations, that the restrictions which at present debar married women in these professions from entering or remaining in the Council's service should be withdrawn. As far as medical women are concerned the new proposal will apply to full-time doctors, except in the hospital and institutional medical and mental hospital service, and to non-resident part-time and sessional doctors. The holders of resident appointments are excluded from the new proposals because it is inherent in the nature of such appointments that their holders should be available for duty when required at any hour of the day or night, and the committee feel that the demands thus imposed are incompatible with the normal domestic and family responsibilities of a married woman. There is, moreover, the immediate practical difficulty of a lack of married quarters. In the event of pregnancy medical women as well as teachers will be required to take 17 weeks' compulsory confinement leave on half pay, of which 4 weeks is to be taken before and 13 after the confinement (4 weeks if the child does not live). Payment for the last 8 weeks of this period is to be withheld until the teacher or medical woman has been back at work for 3 months. The adoption of these proposals, which were accepted by the London County Council on July 16th, will involve some adjustments in superannuation provisions and certain exceptions in respect of officers transferred from the Local Government Board who were engaged under different conditions of service. The concessions are in the nature of a compromise which will give complete satisfaction neither to diehards nor to feminists. The former will continue to protest that however much skill, training, and experience a professional woman may have, her service should be lost to the community on her marriage; the organisations who made representations to the Council will be disappointed that, though its practice has been altered in respect of certain classes of certain professions, the Council has not accepted the principle underlying their representations. For ourselves, we hold that the step just taken is in the right direction and have little doubt that its success will warrant an extension in London and elsewhere of the groups of women allowed to retain their posts after marriage.

JUVENILE RHEUMATISM IN INDIA

To the controversy on whether rheumatic fever occurs in the tropics, Dr. K. L. Wig[1] contributes a record of 30 cases of rheumatic infection in childhood collected in the out-patient department of the Mayo Hospital, Lahore. At a time when the subject was under discussion his interest was aroused by an obvious example of juvenile rheumatism in a boy of ten who developed high fever, swollen joints, subcutaneous nodules, and carditis; salicylates controlled the arthritic phase, but the carditis seems to have been progressive and fatal. Of the 30 patients with evidence of juvenile rheumatism seen at the Mayo Hospital since the beginning of last year, 10 have had simple articular rheumatism (usually subacute) and the brief summaries given, with descriptions of recurrent sore-throat and joint involvement, leave no doubt of the nature of the malady. The same applies to the other two groups—i.e., 5 children with chorea, 4 of whom had a history of joint pains, and 15 patients with involvement of the heart. Some of the latter were adults with established mitral stenosis, with or without auricular fibrillation; the younger ones had early signs of valvular disease. Three young adults, aged 22, 24, and 25, had aortic regurgitation with mitral stenosis, following a definite history of rheumatic arthritis; and this is important since some observers have claimed that, while syphilitic aortic disease is common, rheumatic carditis is rare in the Punjab. The patients in the present series came from villages as well as from congested areas of the towns. Most of them were poor, but that may be because the hospital out-patient population is mostly poor. The rheumatic nature of the illnesses cannot be doubted and it is noticeable that usually, as in this country, the joints were involved at early ages.

AT a meeting of the council of the Royal College of Surgeons of England on July 11th Sir Cuthbert Wallace was elected president.

THE resignation is announced of Miss Ruth Darbyshire, R.R.C., after a serious illness, from the post of matron of University College Hospital. Miss Darbyshire was one of the two matrons who sat on the Lancet Commission on Nursing (1930–32) and deeply impressed her colleagues by her breadth of view, candour, and anxiety to modernise the conditions of hospital service while retaining its fine traditions. At the end of 1932 she was elected a member of the General Nursing Council for England and Wales, and in January of this year she was made vice-chairman of the Council. Her retirement from hospital work is less to be regretted inasmuch as it will give her more leisure in the future for her activities on behalf of a rapidly developing profession.

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[4] Massnahmen vor, während and nach Flugzeugangriffen By L. Bischoff. Basel: Benno Schwabe and Co. 1935. Pp. 28.. Fr. 1.

[1] Indian Med. Gazette, May, 1935, p. 260.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXI.—PROGNOSIS IN EPIDEMIC ENCEPHALITIS: ACUTE AND CHRONIC

IN most epidemic diseases prognosis is chiefly concerned in answering the question, "Will the patient live through the acute illness?" In epidemic encephalitis it goes much further. Even if the acute stage is survived without apparent damage, there is always the possibility of later developments which may not show themselves until long afterwards. When they do, prognosis is required, not only as to the duration of life but as to the temporary or permanent nature of the disorder, and in the latter case as to whether it will remain stationary or become progressively worse. Many of these questions it is as yet only possible to answer in part.

Prognosis in the Acute Stage

AS REGARDS LIFE

There are many possible sources of error in the data on which all case-mortalities are based, owing to the frequent absence of any clear-cut beginning or end of the acute stage, the occasional impossibility of recognising the true nature of even a serious attack, the frequency of unrecognised abortive attacks, and the fact that the number of "occult" cases—i.e., unrecognisable infections without symptoms—is difficult even to guess at. A. S. MacNalty (Epidemic Diseases of the Central Nervous System. London, 1927, p. 151), from the notification figures (1919–1923) found the case-mortality in England and Wales to be 54 per cent. In the Sheffield outbreak of 1924 it came to considerably less. Out of the 301 acute cases notified during the year only 43 died in the acute attack (14·3 per cent.). Similar discrepancies are found in individual records elsewhere. Taking all things into consideration, it would seem that a case-mortality of somewhere about 25 or 30 per cent. is a reasonable figure.

It is generally agreed that the acute attack is more often fatal at later periods of life than in younger persons. It is said by some that the prognosis is also more grave in infancy. In the Sheffield epidemic of 1924 the mortality was high in cases with early respiratory symptoms (polypnœa) but low in cases with abdominal myoclonus as the chief symptom. In a large series of attacks occurring in pregnancy F. Roques (1928) found a case-mortality of 42 per cent. The mortality figures for infection during pregnancy, however, differ somewhat widely. On the whole, to make a prognosis as to life in the acute stage is of little value until symptoms of grave omen or definite signs of convalescence have set in. Cases which for some days are apparently mild may, suddenly, become gravely worse, and even after apparent convalescence fatal symptoms may supervene.

The expectation of after-effects.—Here, also, data are scanty and difficult to obtain. The long period of apparent health, in some cases extending to several years, which may intervene between the recognised acute attack and the onset of chronic symptoms, makes the follow-up of many cases exceedingly difficult. At the end of 1925 a careful follow-up of the 300 acute cases in the Sheffield outbreak (spring, 1924) showed that only about 18 per cent. had recovered completely.

In most of the cases recorded as complete recoveries the original attack had been of mild type. On the other hand, parkinsonism, even of a severe kind, may follow not only a mild acute illness or an abortive attack, but even an "occult" infection. It would also seem to be comparatively rare for complete recovery to follow a severe primary attack. As to the exact form which the after-effects of a severe attack may take, there are no data on which to form a prognosis.

PROGNOSIS IN THE CHRONIC STAGES

As this includes many conditions in which the prognosis is different, it will be more convenient to consider each separately.

(a) *Disorders of sleep.*—In most cases these disappear largely if not wholly within a year or two of the acute attack, whether treated or not. Although in particular individuals sleep may remain abnormal for years, on the whole the permanent amount of this disorder is not a marked feature.

(b) *Various spasmodic attacks.*—The prognosis as regards polypnœa, jaw attacks, torsion spasms, and so forth is much the same as that relating to sleep disturbance. Even severe attacks of torsion spasm, occurring frequently, may after a few months or years become less and eventually disappear.

(c) *Polyuria* is not a common complication. In one severe case in my experience it cleared up completely after lasting for about a year. The man eventually developed severe parkinsonism.

(d) *Epileptic fits.*—Both major and minor fits may occur for the first time either in the acute or chronic stage. Their presence does not necessarily add to the gravity of prognosis. They do not tend to increase in number or severity.

(e) *Mental and moral changes.*—Some of those who during or soon after the acute attack become dangerously impulsive or actively suicidal may improve in those respects in course of time. Such improvement, however, is often associated with an increase in parkinsonism. G. A. Borthwick (Encephalitis Lethargica. London County Council's Report, 1931, No. 2811) at Winchmore Hill finds that of the children showing behaviouristic disorders "the milder cases have done well with the orderly routine of the hospital, and whilst in residence have almost reached normal standards of behaviour." In the more severe cases, however, the prognosis is bad and real improvement is not to be anticipated.

(f) *Oculo-gyric attacks.*—These are always associated with definite, although in some cases only slight, signs of parkinsonism. In a few cases they may, from time to time, become either less frequent or less severe, or both. In one or two this has seemed to be the result of treatment, but detailed inquiry has failed to prove any definite causal relationship. The prognosis as to these is that they continue to occur, at any rate, for ten years after onset.

Post-encephalitic Parkinsonism

DURATION OF LIFE

The parkinsonian syndrome alone does not necessarily shorten life. It must, however, be borne in mind that many of the parkinsonians affected as the result of epidemic encephalitis have received much wider damage to the central nervous system than that which brings about this syndrome alone.

Up to the end of 1934 it has been possible to follow up completely 289 out of over 500 cases of post-encephalitic parkinsonism, of which we have records

Of these 289, 77 have died (just over one-quarter), so that nearly three-quarters of these parkinsonians are alive, at least ten years from the date of the acute infection—and some as much as 15 or 16 years. (In our series the number of acute infections dating from later than 1924 is so small as to be negligible.)

The 77 fatal cases may be divided into two groups: (*a*) those in whom death was not directly due to the disease; (*b*) those in whom death was probably directly due to the disease.

(A) *Death not directly due to the disease.*—24 cases (M., 16; F., 8).

(1) Suicide: 7 cases (M., 5; F., 2).

(2) Accidents: 5 cases (M., 3; F., 2). Three of these were due to bradykinesia. The two women fell on the fire and were fatally burned; one man was found face down in a shallow pool of water. There was no question of suicide in any of these.

(3) Intercurrent diseases: 12 cases (M., 8; F., 4).

(B) *Death probably directly due to the disease.*—53 cases (M., 26; F., 27).

(1) Gradual progressive decline: 45 cases (M., 23; F., 22). It has not been possible to obtain the exact mode of death in many of these cases, but most of them were more or less bedridden, and some had been so for long—sometimes with extreme emaciation and bedsores. Possibly in many some terminal infection ended the scene. The duration of these varied widely: 31 died within five years of infection; 10 died between five and ten years after infection; 4 died more than ten years after infection. The longest was 17 years after. This was a man whose acute attack occurred with the Army in France, in 1917.

(2) Sudden unexpected death: 9 cases (M., 3; F., 6).

These occurred in two ways: (*a*) In seven, death occurred whilst in bed, sometime in the early morning. Six of these were young women and one a youth. In all these the possibility of suicide or of accidental smothering may be certainly excluded. Involvement of the respiratory centre seems a possible explanation. (*b*) In the two remaining cases of sudden death—both males—the cause was a sudden hyperpyrexia with no other symptoms. In each of these death occurred within 24 hours of onset. In one the man had been under close observation in a mental hospital for several years, and except for a parkinsonism of hemiplegic type, was apparently very well. His temperature reached 109° before death. Involvement of the temperature centres seems a possible explanation.

None of these cases of sudden death were bedridden at the time of death, indeed, most of them were able to go about actively; nor was any particular intensive treatment being carried out.

PROGRESS OF DISEASE

As was mentioned above, almost 75 per cent. cases of parkinsonism may be expected to live for at least 10 or 15 years. How much longer remains to be seen. The question then arises: What is their condition likely to be during that period? To form an idea of this we have divided our cases into three groups according to their capacity for looking after themselves—i.e., as regards dressing, feeding, walking about, &c.: group I., completely independent; group II., partially dependent; group III., completely dependent.

A follow-up of 212 cases living at the end of at least ten years from the date of acute infection gives the following: group I., 70 per cent.; group II., 18·5 per cent.; group III., 11·5 per cent.

These cases include a certain number in institutions and also those attending the out-patient clinic.

CONCLUSIONS AS REGARDS CHRONIC PARKINSONISM.

1. Absolute recovery with complete disappearance of all symptoms is unknown.

2. Complete or almost complete standstill does occur, at any rate, for as much as 16 years.

3. Most cases tend to become worse, but the rate at which this happens is extremely variable. In a few it may be measured by weeks, in more by months, in most by years.

4. Suitable treatment may cause marked improvement in the muscular rigidity and, if continued, maintain the improvement for long periods.

5. Tremor, when once developed, does not disappear entirely, but tends to get worse. No treatment yet known has any permanent effect in stopping it.

6. Excluding suicide and accident, about 23 per cent. of parkinsonians die within 10 or 15 years of infection. Of these, in about 15 per cent. the end is expected, and preceded by progressive failure; in about 5 per cent. there is definite intercurrent disease; whilst in about 3 per cent. sudden and unexpected death may occur at any time whilst the patient is apparently in his usual health.

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THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. W. J. Morris to *Victory* for R.N.V.

Surg. Lts. L. G. Yendoll to *Vernon*, J. M. T. Reese to *Codrington*, and J. L. S. Coulter to *Maine*.

Surg. Lt. (D.) S. R. Wallis to *Ramillies*.

Proby. Surg. Sub.-Lt. R. F. Hand to *Lucia*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdrs. S. B. Borthwick to *Pembroke* for R.N.B. and to *Australia*, A. S. Bradlaw to *Courageous*, and H. A. M. Whitby to *Rodney*

ROYAL AIR FORCE

Flight Lt. R. K. Muir to No. 3 Armament Training Camp, Sutton Bridge.

Wing Comdr. T. C. St. C. Morton to R.A.F. Institute of Pathology and Tropical Medicine, Halton, for duty as Commanding Officer.

Flight Lt. O. M. Fraser to R.A.F. Hospital, Cranwell.

Dental Branch.—Flight Lts. J. M. Jamie and F. B. Sumerling are transferred to the Reserve, class D. Flying Offr. K. G. Swiss, to Medical Training Depôt, Halton, on appointment to a non-permanent commission.

AUXILIARY AIR FORCE

No. 603 (City of Edinburgh) (Bomber) Squadron: I. A. G. L. Dick is granted a commn. as Flying Offr.

INDIAN MEDICAL SERVICE

The undermentioned apptmts. are made:—

Majs. to be Lt.-Cols.: C. J. L. Patch, M.C., and S. L. Mitra.

To be Lts. (on prob.).: Raymund Joseph Henderson and C. W. A. Searle.

Indian Medical Department.—Maj. (Sen. Asst. Surg.) A. R. H. Boyne retires.

COLONIAL MEDICAL SERVICE

Dr. H. B. Boucher has been appointed Medical Officer, Nigeria.

SPECIAL ARTICLES

THE BEST METHOD OF MANUAL ARTIFICIAL RESPIRATION AND HOW TO APPLY IT

By C. J. Mijnlieff, M.D.

SECRETARY-GENERAL OF THE INTERNATIONAL SOCIETY FOR LIFE-SAVING AND FIRST AID IN ACCIDENTS, AMSTERDAM

> ". . . The negative result of a search of the literature has made me conclude that the mechanical side of respiration has not received the attention it deserves."
> —*Sir Charlton Briscoe* (1927)

Scientific investigations have led us to change our views of the requirements which a method of artificial respiration must meet. These may be summarised as follows.

THE DESIDERATA

1. *Sufficient ventilation of the lungs must be secured.*—In experiments on living persons (or animals) and on cadavers several factors have to be taken into consideration: in living persons, their unconscious and involuntary breathing, the muscular tonus of the muscles and the reflexes; in the cadaver, the altered tonus and rigor mortis. Because of failure to give these factors their proper weight the conclusions drawn from many experiments are not of great value. Thus the results of all investigations before Ploman's must be judged with reserve, and also those of Schäfer and Hamburger. Values before Liljestrand are wrong; but his own observations were very useful, and he took also into account the influence of frequency of respiration (see Table).

Ventilation of the Lung by various methods of Artificial Respiration, According to Various Investigators

Investigation by—	Method of—	No. of resp. per min.	Ventilation— Per resp. (litres).	Ventilation— Per min. (litres).
Ploman (1906) ..	Silvester ..	7–12	1·2–2·0	12–20
	Howard ..	10–14	1·0	10–15
	Schäfer ..	16–20	0·5–0·6	8–12
Liljestrand (1913).	Silvester ..	15	0·54	8·1
	Schäfer ..	15	0·50	7·5
During apnœa ..	Silvester ..	15	0·19	2·85
	Schäfer ..	15	0·17	2·55
Loewy-Meyer (1919)	Howard ..	14	0·447	6.25
	Silvester-Brosch	9–10	1·121	10·65
Bruns (1923) ..	Silvester ..	—	0·2	—
	Howard ..	—	0·05	—
	Van Hasselt-Schüller ..	—	0·1	—
	Schäfer ..	—	0·02	—

In looking at this Table it must be borne in mind that Ploman, Liljestrand, and Loewy-Meyer experimented on living persons, Bruns on the still warm cadaver. The figures in the experiments on persons in a state of apnœa are really too low because the tonus of muscles, especially of the diaphragm, is increased in apnœa (Loewy). Bruns's figures are also probably too low, because a certain amount of rigor mortis had set in. Hence the absolute values obtained cannot be regarded as reliable; but the figures are nevertheless important because they give an idea of the comparative value of the various methods employed. It will be seen that quantitatively Silvester's method gives the best ventilation.

2. *Absorption of oxygen and excretion of carbon dioxide in the alveoli, and respiratory blood circulation to and from the heart, must be promoted.*—What Brosch said in his criticism of expiratory methods is very true: "The human and animal organism does not need a physical inspiration (entrance of air into the bronchial tree) but a physiological inspiration (entrance of air into the alveoli)." Ploman and Brosch inferred that methods promoting active inspiration as well as active expiration are to be preferred because they introduce more air, cause greater enlargement of the thorax and increase the pulmonary circulation of blood. We now know that this last action is of great importance in the treatment of apparent death and that it can be secured only by rhythmical increase and decrease of the negative pressure in the thorax, as in physiological breathing; the walls of the alveoli are distended, capillaries in these walls are relaxed and dilated and blood thereupon flows from the right to the left side of the heart.

3. *The nutrition and function of the heart itself, and as far as possible of the large somatic circulation, must be promoted.*—Bruns has determined the effect of different methods of artificial respiration on blood pressure, which he measured in the cadaver at various places in the heart, large arteries and veins. Under Silvester's classical method the pressure dropped 8 cm. (of water) on inspiration and rose 1 cm. on expiration; under Silvester's method with expiratory pressure on the thorax it also dropped 8 cm. on inspiration, but rose 18 cm. on expiration; under Howard's method it dropped only 0·5 cm. on inspiration and rose 10 cm. on expiration. But with Schäfer's method, directly the cadaver was turned over the manometer registered a *positive* pressure of 12 cm., and despite strong expiratory pressure upon it there were no variations of any importance. This means that in Schäfer's method no inspiratory or expiratory change in the blood pressure is brought about; hence it has no influence on the circulation of blood. Silvester's, on the other hand, has a very favourable influence on the passage of blood—also much greater than Howard's.

Bruns showed that in the cadaver artificial respiration by Silvester's method caused blood to pass from the right side of the heart to the middle branches of the basilar artery in eight minutes. He has also shown that Silvester's plus Howard's method arterialised the blood in both sides of the heart very considerably; thus in twenty minutes its oxygen content rose from 8 per cent. to 24 per cent. and by inhalation of oxygen to 48 per cent. Bruns and Thiel have proved, moreover, that the method causes blood to flow into the finest branches of the coronary arteries. And here it is appropriate to recall Magnus's observation that after oxygen has ceased to reach it the heart contains for four or five minutes a reserve of oxygen. Furthermore, when the heart is stopped reflexly, the lungs, blood, and tissues may still contain enough oxygen to preserve the irritability of the heart as long as twenty minutes.

Many investigators have made it clear that artificial respiration in itself has a favourable influence on the heart's action and that Silvester's method stimulates the heart probably as follows: mechanically, by pressure on the thorax, rhythmically repeated, causing, by the resulting alternate diminution and enlargement of the thorax, a pulling of the various parts of the heart (especially the auricles) and of the large vessels at their origins; and by rhythmical alteration of the contents of the heart and large blood-vessels. It also acts reflexly—by enlarging and diminishing the chest cavity, distending the lungs, making the pleuræ tense, and stretching the diaphragm—through the vagus and phrenic nerves.

Bruns (1934) has now proved, by experiments on dogs, that after the heart has been stopped (ascertained by clinical examination) by asphyxia, action currents in its muscle can still be demonstrated during some half hours. Also that at this time *normal lasting* heart action and respiration can still be evoked by Silvester's or Howard's method together with indirect massage of the heart, not by artificial respiration alone.

It seems to me that on these considerations Schäfer's method can hardly be recommended. The above experiments suggest that Silvester's modified method is the best means of meeting requirements 2 and 3.

4. Last, but not least, *there must, as far as possible, be no injury to the patient.*—It has been said that Silvester's method carries a danger of fracture of the ribs; but such an accident is possible only if it is carried out very roughly. Not long ago I inquired of every pathological institute in the Netherlands and found no case reported for 30 years or more, although Silvester's is the method far and away the most often used. In Howard's method the danger is greater.

Schäfer wrote of the risk of rupture of the liver if Silvester's method is used; but in my inquiry no such case was discovered and I agree with Keith that this risk is much greater with Schäfer's own method. Nevertheless this danger should be borne in mind, and also the possibility of rupturing the thin-walled right side of the heart distended with blood.

One advantage of Schäfer's method is said to be that when the patient is lying face downwards, water, mucus, and dirt can flow out of his mouth. I regard this rather as a danger than an advantage; for every time we lean on the small of the patient's back the stomach may be compressed and some of its contents (mud, bits of fruit, &c.) may be pressed suddenly or gradually upwards above the level of the vocal cords, so that the next inspiration sucks them deep into the trachea. Not long ago a case well known in forensic medicine in Holland proved that this danger is no imaginary one (although in this instance Howard's method was employed).

My examination of current methods of artificial respiration has thus led me to disapprove of Schäfer's method, notwithstanding its simplicity, and to affirm that Silvester's—as modified by the facts discovered since he introduced it—is the best.

HOW DOES SILVESTER'S METHOD WORK?

An anatomical investigation made in Prof. M. W. Woerdeman's department at Amsterdam has brought me to certain definite conclusions about the best way of applying Silvester's method. When I had finished my research, my attention was drawn to Sir Charlton Briscoe's Lumleian lectures on physiological respiration; and his words reproduced at the head of this paper agree with my own conclusion.

Hitherto all investigators have taken it for granted that, in Silvester's method, the chest expands through the extension of the muscles—especially the chest muscles—caused by the upward, backward, and downward movements of the arms. On this assumption Silvester advised—and so far he has been followed by every other investigator—vigorous traction of the arms. I shall now show that this is a mistake.

After the muscles of a cadaver from the head to the pelvis have been prepared, and the sternum sawn through or not, Silvester's method can be demonstrated perfectly by moving the arms when the pectoralis major and minor, latissimus dorsi, &c., have been severed. Its action is just the same as when the muscles are intact, and from this it is obvious that these muscles cannot be of any importance for artificial respiration. They only become tense when for other reasons movements of the scapulæ, clavicles, sternum, and ribs have been made. And in the apparently dead person the muscle-fibres are too weak, and the fasciæ (at least those of the large chest muscles) too thin, to offer much resistance to the forcible movements of artificial respiration.

Let us see what happens when Silvester's method is applied.

If the patient is lying horizontally, movements of the arm upwards, backwards, and downwards involve the shoulder-joint only until the arms are at right angles to the body, or less; after the lowest part of the shoulder capsule has stretched to its fullest extent any further movement of the arms backwards and downwards is carried out in the shoulder-ring. If the humerus is not abducted too much—and excessive abduction should be avoided because it presses the humerus against the acromion process and starts a false movement of the scapula—the humerus will push against the elastic roof of the shoulder-joint, formed by the acromion, the coraco-acromial ligament and the coracoid. Above this roof runs the clavicle, which is connected with the scapula by the acromioclavicular joint and (above the coracoid) by the strong coracoclavicular ligament, with the first rib by the costoclavicular ligament and the subclavius muscle, and with the sternum by the sternoclavicular joint and the strong sternoclavicular ligament.

The anterior chest muscles do not become tense, and the coracoid does not move backwards, until the arm is at right angles. But when the coracoid has been turned upwards and backwards, so making the pectoralis minor tense, the movements next described have already started. Further movements of the arms backwards and downwards are made possible, and at the same time limited by the mobility of the scapula and the clavicle round an axis which joins the sternal end of the clavicle to the inferior angle of the scapula. The scapula turns by the strong tension in the coraco-acromial and coraco-clavicular ligaments, in such a way that its lowest point deviates laterally 9–11 cm. from its normal position (up to 19 cm. from the vertical column) being fixed, as it were, in position and pressed against the thorax by a common muscle plate formed by the rhomboid, serratus anticus, and latissimus dorsi muscles (Mollier). (See Figure.)

During these movements of the arms backwards and downwards the humerus presses first against the clavicle, which then rotates, forwards and upwards round its own axis, at the sternoclavicular joint. This rotation, owing to the joint connexion with the sternum and to the strong costoclavicular ligament (+ subclavius muscle), causes the sternum and the first rib, and subsequently also the other ribs by the intercostal ligaments (and muscles), to make the movements characteristic of ordinary maximal inspiration. The pectoralis major is of practically no importance here; the pectoralis minor, by reason of its thicker and tougher tendons, may play some part. At the end of the movements the lowest ribs are drawn up and the latissimus dorsi is stretched.

When the ribs have been rotated to the maximum extent permitted by the costovertebral joints, the costovertebral ligaments and particularly the costo-transverse ligaments are so much stretched that the spine is first extended and then takes up a position of lordosis. This extended position is the one most favourable for artificial respiration, for the thoracic cavity is then enlarged as much as possible in all dimensions—longitudinal, transverse, and sagittal. By moderate extension of the spine the abdominal cavity is enlarged, and this relieves the diaphragm from the pressure on its underside of the liver and other abdominal contents and brings it into a better position for inspiration. In the position of lordosis, on the other hand, the abdominal wall is brought nearer the vertebral column, the superficial abdominal fascia becomes more and more stretched, the xiphoid process is pressed back, and the lower ribs are hampered in their movement upwards by the increased tension of the side walls of the abdomen (Strasser); the chest is more or less flattened and the thoracic cavity therefore decreased. Moreover, when the lordosis is carried further the pelvis is lifted up and this throws the abdominal contents against the diaphragm, thus making the thoracic cavity still smaller. Hence I do not think it advisable to continue extension farther than the straightening of the thoracic vertebral column which follows automatically the arm movements indicated above, provided that a *thick* folded coat or blanket has been placed under the back.

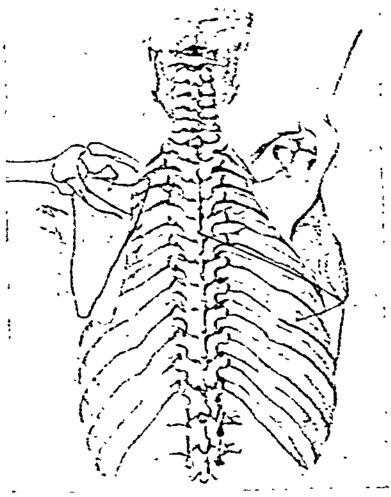

Diagram illustrating abduction and elevation of the arms. (Reproduced from H. Braus, "Anatomie des Menschen," Berlin, 1921.)

HOW TO PERFORM ARTIFICIAL RESPIRATION

For the above reasons I advise the application of Silvester's method as follows.

The mouth and throat are first cleared of water, mucus, mud, artificial teeth, or food debris. The clothes are then loosened and the patient turned on his back. A thin folded coat or blanket may be placed under the back, from the neck to the loins, to steady the patient and allow free movement of the shoulder blades. The lower jaw is pressed forward and the head turned well to one side, bending it back so that the neck is stretched, in order to keep the entrance to the air passage free. The tongue can be held out with forceps (according to Leyden) or bound with a small lace or tape outside the teeth, tying the ends together at the back of the neck.

The method should begin with an *inspiratory* manipulation, expanding the chest and consequently increasing the negative pressure, to relieve the task of the right side of the heart, probably overfilled with blood. The operator kneels on one knee—a position less tiring than any other—and grasps the arms with his thumbs in the bend of the elbow and his fingers enclosing its point. When he moves the arms upwards, backwards, and downwards so that the humerus comes into contact with the coraco-acromial ligament, the thumbs turn round the elbows; and when he presses the elbows back alongside the head the thumbs come to lie on the outside of the elbows. This pressure should be firm, and will then, lead to the maximum enlargement of the thorax; the spine will be straightened but the abdominal wall will not be too tense. The patient is left in this position for a second, to allow air to penetrate into the lungs, and then the arms are returned along the same path, upwards, forwards, and downwards, and the elbows are pressed together carefully. This considerably narrows the thorax by shortening the sagittal diameter, without endangering the heart and liver, avoiding at the same time the danger of œdema of the lungs (Jellinek).

The question now arises: What should be the rate? From the investigations of Liljestrand, Bruns, and Rhaesa we know that with a frequency of 17 times a minute every respiration is used to its full value. In order to stimulate the heart a frequency as great as possible would be desirable; on the other hand, it is essential that the inspired air should mix with the air in the lungs. Accordingly I suggest that the correct rate is 15 artificial respirations per minute.

From the description I have given it may appear that an assistant is not strictly necessary, but the latest investigations of Bruns (1934) show that if possible, the heart should be stimulated by massage (70 to 100 times per minute) while artificial respiration is proceeding. Other assistants can rub the body with warm cloths and apply friction to the hands and feet. Oxygen should be administered if it is available, and if a doctor is present he should inject Coramine into a vein or even into the heart. If the heart functions again but respiration remains in abeyance, or if the heart is functioning from the beginning though the patient does not breathe, then artificial respiration must be continued, combined if possible with inhalation of oxygen mixed with 5–7 per cent. carbon dioxide. An injection of lobeline may be given to stimulate the respiratory centre.

Should there be a fracture of one or both arms, Silvester's method cannot be applied and Pacini's (which now, for the first time, in my opinion, can be properly understood), should be considered. This, however, may be too difficult for first-aid men. Therefore I should prefer van Hasselt-Schüller's method or a combination of van Hasselt's and Howard's. I do not agree with Ploman and others that Silvester's method can only be applied to muscular patients, for my anatomical research has shown that its action depends mainly on the joint capsules, strengthening bands and ligaments, and not on the muscles.

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(*Continued at foot of next page*)

NATIONAL CONFERENCE ON MATERNITY AND CHILD WELFARE

(Concluded from p. 40)

THE health of the child between the ages of two and five years was further discussed at sessions of the Conference held on July 2nd and 3rd at Queen Mary Hall, Great Russell-street. Quoting Freud's statement that "the little human being is frequently a finished product in his fourth or fifth year," Prof. OLIVE WHEELER, D.Sc. (University College of South Wales and Monmouthshire, Cardiff), suggested that even before school age a child was capable of all the elementary thought processes found in more complicated forms in adults. She maintained further that the emotional growth of the individual in these early years was even more significant for the future, and that patterns of character and behaviour laid down at that time remained throughout life.

The Duchess of ATHOLL, M.P. (chairman), questioned this view on the ground that, carried to its logical conclusion, it would mean that subsequent training and self-discipline were doomed to failure. She took exception to an analogy between plant life and child life, the fundamental difference lying in the fact that the human being had a moral and spiritual nature which she believed was capable of overcoming the effects of even the worst beginnings.

Dr. WILLIAM MOODIE (director, London Child Guidance clinic) at another session upheld the opinion that certain tendencies and attitudes laid down before the age of five persisted right through life and that, though they might be overgrown, they were never destroyed, and might reappear at any time under stress. The habit of crawling, for example, was left behind with babyhood, but many people, faced with the ordeal of passing over a narrow and precipitous ledge, would instinctively drop on their hands and knees for greater safety. Dr. Moodie's experience led him to the conclusion that the public, especially parents, were inclined to exaggerate greatly the effects of trauma as a direct cause of breakdown, instead of recognising it as a danger signal pointing to the presence of underlying instability. He had known children pass through devastating experiences—being sexually assaulted, killing people accidentally, being present at the murder of their parents—and come through quite unscathed. Again, the breaking up of a home was not in itself of great importance; what mattered was the way in which it was broken, and the atmosphere of disturbance, recrimination, and half-truths that had preceded the rupture. The child or adult who broke down had been sensitised to shock beforehand by a long series of strains or stresses. Dr. Moodie had never met a child suffering from the result of psychological trauma pure and simple, though it was common enough to find children suffering from an anxiety state conveyed from a grown-up person by a continued process.

Mr. G. R. GIRDLESTONE (hon. surgeon and clinical director, *Wingfield-Morris orthopædic hospital*) mentioned four groups of conditions leading to physical disability: (1) congenital defects; (2) static or postural defects; (3) such conditions as tuberculosis of bones and joints, acute osteitis, arthritis, and poliomyelitis; and (4) injuries to any part of the locomotor system. The coöperation of many individuals—midwives, mothers, general practitioners, school medical officers, teachers, the staffs of general and cottage hospitals—was essential to ensure that these various types of case should find their way to the orthopædic hospital at the earliest possible moment. Mr. Girdlestone spoke enthusiastically of the successful treatment of acute anterior poliomyelitis by the administration of convalescent serum. Every child with an illness of the influenza type should be made to kiss his knees morning and evening. The moment he was unable to do so, owing to stiffness of the back or neck due to inflammation of the meninges, the case should be reported to the doctor for exact diagnosis and treatment.

Dr. ETHEL CASSIE (senior assistant medical officer of health for maternity and child welfare, Birmingham), who had investigated statistics of school entrants in Birmingham requiring medical treatment, emphasised the importance of infective conditions among young children. Although these ailments were less numerically impressive than non-infective conditions, they had far-reaching effects on health, happiness, and education. From the point of view of permanent or prolonged disability, tuberculosis, pulmonary infections, mastoid disease, and rheumatism stood high. Home visiting helped in the discovery of children suffering from these defects, and medical inspection made the diagnoses clear, but the real need was for early and prolonged treatment. All medical officers knew the child who had had pneumonia "three times," in other words, who had not recovered from one attack before breaking down again. Such children required long periods of convalescence in good surroundings, until the lungs were clear not only clinically but radiographically. Rheumatic infection also called for prolonged treatment, and the same was true of chronic otorrhœa and sinus infections.

Mr. C. PEYTON BALY, L.D.S., said that the school

(Bibliography continued from previous page)

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dental service (though too often refused by parents) had done a good deal to improve the teeth of school leavers, but the teeth of entrants were still in a lamentable condition. Many authorities failed to make the best use of their dentists, the service being judged by the number of operations performed rather than by the condition of the children. Too much of the dentist's time was taken up by clerical work and treatment of casuals, allowing no time for instruction of teachers, children, and parents. The most valuable aids to sound teeth were clean fresh foods, especially milk and fruits, sunlight and air free from smoke pollution, cleaner habits, and more dentists to care for the mouths of mothers and children.

Dr. A. Doyne Bell (chief assistant, children's department, St. Thomas's Hospital) pointed out that the time between two and five years of age was the period of the child's maximum susceptibility to infectious disease, and at the same time he was coming increasingly in contact with infections owing to his developing gregariousness and growing ability to get about. Other factors contributing to the high incidence of infectious disease at this age were faulty nutrition and insufficient sleep, the latter being bound up with the problem of overcrowding. The object of studying dietetics was not to produce a child of standard weight and height but a healthy child. The financial problem of feeding a family could not be divorced from the dietetic problem. It was often an economic necessity to feed the young child on the same food as his parents, but this necessity could be turned into a virtue by teaching the parents to eat wholesome, well-cooked food. There was a tendency to discriminate too little between infected tonsils and large tonsils. The removal of infected tonsils, even in a young child, was a justifiable preventive measure, but the removal of tonsils merely because they were large—a normal condition in childhood—was to be deplored.

BEIT MEMORIAL TRUST FOR MEDICAL RESEARCH

A meeting of the trustees of the Beit Memorial Fellowships for Medical Research was held on July 12th, for the election of Fellows and other business.

The trustees expressed their deep regret at the recent death of Sir John Rose Bradford, F.R.S., who had been an original member of the advisory board in 1909 and had, together with the late Sir James Kingston Fowler, taken a most important share in advising Sir Otto Beit upon the foundation of the trust. Sir John remained on the Advisory Board for 12 years, and subsequently gave valuable service as a trustee for the last five years of his life.

Confirmation was given to the appointment of the Lord Macmillan as a trustee, and Prof. T. R. Elliott, F.R.S., was also appointed a trustee in succession to Sir John Rose Bradford. The trustees accepted with regret the resignation of Sir Charles Sherrington, F.R.S., from the advisory board after 24 years of service throughout which his wisdom and special knowledge had given invaluable aid to the work of the trust. They appointed in his place Dr. E. D. Adrian, F.R.S., Foulerton professor of the Royal Society.

The trustees noted with pleasure that two members of the advisory board had received honour recently from the King, Sir F. Gowland Hopkins being granted the Order of Merit, and Sir Patrick Laidlaw that of knighthood. Fellowships during the year 1934–1935 were held by 26 workers. Among the appointments gained during the year by past Fellows may be noted that of Dr. J. R. Marrack to the professorship of chemical pathology, University of London, at the London Hospital; of Dr. A. St. G. Huggett to the professorship of physiology, University of London, at St. Mary's Hospital; of Dr. W. P. Kennedy to the professorship of biology, Royal Medical College, Bagdad; and of Dr. F. H. Smirk to the professorship of pharmacology in the Egyptian University, Cairo. Dr. W. R. Aykroyd has been appointed director of nutritional research under the Indian Research Fund Association. Dr. S. Zuckerman was awarded the W. J. Mickle prize fellowship for 1935 of the University of London.

The Trustees did not elect this year a Beit professorial Fellow, but they hope to make such an appointment as soon as a suitable occasion arises.

The following elections to Fellowships were made:—

Senior Fellowship

Robert Hill, M.A. Camb. To continue his studies on the respiratory function of hæmoglobin. At the Physiological Laboratory and the Molteno Institute, University of Cambridge.

Fourth Year Fellowships

Robert Gaddie, B.Sc., Ph.D. Edin. To continue his research on the metabolism of heart muscle. At the departments of medical chemistry and materia medica, University of Edinburgh.

John Michael Robson, D.Sc., M.D. Leeds. To continue his work on the hormonic factors concerned in the maintenance of pregnancy and initiation of parturition. At the Institute of Animal Genetics, University of Edinburgh, or the School of Agriculture, University of Cambridge.

Frank George Young, B.Sc., Ph.D. Lond. To study the diabetogenic factors of the anterior pituitary gland. At the department of physiology and biochemistry, University College, London.

Junior Fellowships

Alexander Robertus Todd, B.Sc. Glasg., Ph.D. Frankfurt, Ph.D. Oxon. Carnegie research scholar 1928. Proposed research: The molecular structure of vitamin B_1. At the department of medical chemistry, University of Edinburgh.

Robert John Kellar, M.B., Edin., M.C.O.G., Leckie-Mactier Fellow in medical research 1934–35. Proposed research: The problem of nephritis and high blood pressure associated with pregnancy. At the London laboratories of the Royal College of Surgeons, and the obstetric unit, University College Hospital, London.

Norman Lowther Edson, M.B., N.Z. Medical travelling scholarship, University of New Zealand 1930. Proposed research: Fat metabolism and ketogenesis. At the Institute of Biochemistry, University of Cambridge.

Myer Head Salaman, M.D. Camb. Research on virus diseases under Prof. S. P. Bedson, F.R.S. At the London Hospital 1932–34. Proposed research: Investigation of the antigenic structure of the vaccinia virus. At the Lister Institute of Preventive Medicine, London.

James Davidson Fulton, B.Sc., Ph.D., M.B.Glasg. Chemist to the Manchester Committee on Cancer 1928-30. Proposed research: The experimental chemotherapy of malaria. At the London School of Hygiene & Tropical Medicine.

Adèle Helen Rosenheim, M.A. Camb., Ph.D. Lond. Grocers' Company Research Scholarship 1931–33. Proposed research: The chemical nature of antibodies, especially those in antityphoid sera. At the Lister Institute of Medicine, London.

All correspondence of Fellows and candidates should be addressed to Prof. T. R. Elliott, F.R.S., hon. secretary, Beit Memorial Fellowships, University College Hospital Medical School, London, W.C.1.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

FINANCIAL AID FOR PUBLIC HEALTH

THE Congress has at length taken cognisance of the present inadequate provision for public health in large areas of the nation. Only 528 out of 3000 counties are served by full time officials, and even among these comparatively few have degrees in public health. The Social Security Act just passed by Congress makes provision for federal aid amounting to 8,000,000 dollars to be distributed through the public health service, and for a further 6,650,000 dollars to be distributed for maternal and child health and for crippled children through the children's bureau. The public health service is in the Treasury department under the special supervision of Miss Josephine Roche, assistant secretary of the Treasury. The children's bureau is in the Department of Labour. There will, however, be some attempt to coördinate the administration of these two funds both intended for public health purposes. The fact that the present assistant chief of the children's bureau is a physician will probably remove some of the antagonism formerly felt by the organised medical profession to work done by this bureau under the provisions of the Sheppard-Towner Act.

A meeting of State and territorial health officers was held in Washington on June 17th and 18th, at which agreement was reached with officers of the U.S. Public Health Service regarding standards of public health administration which must be met to justify reception of federal subsidy, the basis on which the 8,000,000 dollars would be allotted to the several States, and the qualifications of training which in future are to be required of public health personnel.

A qualified full-time State health officer must be in charge of the State health department receiving subsidy. The department must give adequate administrative guidance to local health services, and must include competent divisions of vital statistics, laboratories, epidemiology, and environmental sanitation. No subsidy will be allocated to any local health unit whose staff does not include at least one full time health officer, two nurses, one sanitarian (sanitary inspector), and one clerk. When more than one county is included in an administrative district there must be at least one public health nurse in every county.

Health officers in charge of an area having 50,000 or more population must have had at least a year's training in a course of public health which includes specified courses (including biostatistics and epidemiology), and which corresponds to a modern university training leading to the certificate in public health (C.P.H.). Health officers of smaller units must have specialised in public health work before they were 35 years of age. Preference is given to those who have had one or more years' experience in the general practice of medicine. All health officers who have not degrees in public health must be prepared to take post-graduate training. Provision is made under the Act to assist them in obtaining this training. It is realised however that present academic facilities will limit the number that can be trained in the immediate future. It is clearly intended that a standard equivalent to the British standard shall be reached as rapidly as the training facilities will permit. Standards are laid down similarly for the training of public health nurses and of sanitarians.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

EDINBURGH'S HEALTH

SOME interesting statistics are given by Dr. John Guy, medical officer of health in the annual report for 1934 on the health of the city of Edinburgh. The birth-rate for the year was 15·7 which shows an increase over the previous year. Of the total births 6·4 per cent. were illegitimate. The death-rate was 12·8. The infant mortality-rate was the lowest on record for the city, being 62 deaths for 1000 live births. The effect of re-housing tenants from condemned buildings is shown by the health figures for the Prestonfield re-housing area, to which the tenants in the St. Leonards improvement scheme were transferred en bloc. This has resulted in a reduction of the death-rate for this community from 21·9 in 1927 to 7·7 in 1934, a reduction of the death-rate from pulmonary tuberculosis from 1·5 to 0·3, and a reduction in the epidemic diseases death-rate of from 3·4 to 0·3. The greatest improvement was observed in the infantile mortality-rate, which in 1927 was 132 per 1000 births in the old area but only 28 per 1000 births in the new area in 1934. The problem of overcrowding is still acute, and the new cases of overcrowding notified during the year are almost equal in number to those which were dealt with by providing families with larger houses. The pulmonary tuberculosis death-rate for the year was 0·66 per 1000, which makes a new low record for the city, and is less than half the death-rate 34 years ago. 4530 patients were admitted to the City Hospital for infectious diseases. No case of diphtheria or scarlet fever occurred among the nursing staff, a feature which Dr. Guy attributes to active methods of immunization. In this connexion Dr. Guy emphasises the importance of the campaign for immunization against diphtheria. An arrangement has been made whereby all medical practitioners in the city can give this protection free of charge to all who apply. The arrangement whereby the professor of bacteriology acts as director of the bacteriological services has proved very satisfactory.

The work of the municipal general hospitals continues to increase, and nearly 6000 patients were treated during the year. The arrangement whereby there are resident students in the Western General Hospital has proved to be of great value. Dr. Guy went to show that the children now leaving school are physically and medically fitter than they have ever been, but that this improvement was not so marked in the case of those entering school for the first time. There is however a decided reduction in the incidence of rickets and tuberculosis. In 1907 5·8 per cent. of the boys and 7·8 per cent. of the girls entering school for the first time were found to have acquired deformities; the corresponding figures for last year were 0·5 and 0·4 respectively. Dr. Guy concluded that the Edinburgh statistics compared favourably with those of other large towns, and said that there can be no doubt that the steps taken to demolish overcrowded and derelict houses in the city are having a beneficial effect on the health and well-being of the community.

CORRESPONDENCE

TREATMENT OF TUBERCULOSIS OF THE LUNGS BY MEANS OF BI-LATERAL COLLAPSE

UNEXPLAINED DEATH

To the Editor of THE LANCET

SIR,—This history and description of a case of death occurring three months after the establishment of bi-lateral artificial pneumothorax treatment, is sent to THE LANCET because of the comparative rarity of such a catastrophe, and because I am quite unable to give any explanation why the patient succumbed.

Mrs.——, aged 45 years, was found to be suffering from Pulmonary Tuberculosis in 1928, on the occasion of a first and only hæmoptysis. She had previously suffered from quinsy, dengue, measles, and whooping-cough. All her ascendants, her husband, and her only child were free from tuberculosis.

A left artificial pneumothorax was induced in the Brompton Hospital in October, 1928, and she was then sent to the Frimley Sanatorium, and stayed there from February to October, 1929. Refills were continued during residence at home till 1932 when collapse was abandoned as all symptoms of disease of the lungs had subsided and skiagraphic examination of them failed to reveal any evidence of active disease. From 1932 onwards, she remained well until the middle of 1934 when expectoration of tubercle bacilli gradually returned and she began to lose weight. These symptoms did not abate with home treatment on sanatorium lines and she was readmitted to the Brompton Hospital on March 11th, 1935, when she was found to have a raised temperature—99° in the evening, under-weightness signs of æro-œdema, bronchial breathing and dyspneumonophony at the upper part of the left lung. On skiagraphic examination extensive infiltration, fibrosis, and excavation in the upper and middle zones of the left lung and moderate widespread infiltration in all zones of the right lung were found.

On March 13th, 1935, pneumothorax was re-established on the left side by thoraco-puncture at the angle of the scapula, after unsuccessful attempts had been made in the axilla. Owing to numerous adhesions the collapse induced remained small and mainly localised at the posterior part of the left lower lobe. On March 18th, 1935, a pneumothorax was successfully established on the right side and partial collapse was obtained; complete collapse being prevented by the presence of adhesions which were much less developed than on the left side. The patient remained in the hospital until May 17th, 1935, by which time simultaneous weekly refills were being given, the right chest receiving on each occasion 400 c.cm., giving a final mean pressure of −2, the left chest receiving 250 c.cm., giving a final mean pressure of + 1.

Her condition had improved very considerably by the time she left the hospital, all fever and expectoration having ceased, although the large cavity present at the apex of the left lung was only moderately compressed; she returned home to the country and she visited the refilling department of the Brompton Hospital each week for the next three weeks and had the same quantity of air introduced each time. At the fourth visit to the hospital on June 13th, 1935, she looked and felt very well; screening showed slight re-expansion of the right lung and the following refills were given: right lung 450 c.cm., giving a mean pressure of −2; left lung 250 c.cm., giving a mean pressure of +4. On her way from the hospital to South Kensington Station she began to feel so breathless that she considered it wise to return to the hospital, becoming ill shortly after admission. The intrapleural pressures were found to be: right +5, and left +15, and air was removed from each pleural cavity, the final pressures being: right −5, and left −1. Recovery was immediate but she was detained in the hospital over-night for close observation; when seen at 11 P.M. and in the early hours of the morning she seemed quite well, but when she awoke at 8 A.M., after a good night's sleep, she again became very ill and died suddenly.

Post-mortem examination was carried out by Dr. E. E. Atkin. Chest: bi-lateral pneumothorax; no effusion in either pleural cavity; strong adhesions over the upper part of each lung especially the left; universal pleural adhesions over the anterior and lateral surfaces of the lower left lung; the lungs were inflated through the trachea, under water, but no evidence of fistula could be found in either lung. On section, the right lung revealed fibroid tuberculosis at the apex and foci of recent tuberculosis infiltration in the lower parts; the left lung showed a large cavity near the apex containing pus and foci of tuberculosis infiltration in the lung tissue behind and below it. There was no pulmonary thrombosis. The heart showed no abnormality in muscle, valves, or coronary arteries; no abnormality was found in the brain and all other organs were normal except the larynx which showed slight ulceration of the left vocal chord.

The onset of shortness of breath and the increase of intrapleural pressures found after its onset on June 13th suggested that spontaneous pneumothorax had occurred, and the prompt recovery when air was removed confirmed this view. It was very remarkable that the patient should have had a comfortable night after the removal of air and yet should have died suddenly fourteen hours after such removal. At no time, whether at the second induction of pneumothorax or at any refilling, had she shown evidence of plural shock. There was no evidence that would lead one to suspect that she was a drug-addict.

I hope that some other readers of THE LANCET will be able to communicate to you an adequate explanation for the untimely end of this patient.

I am, Sir, your faithfully,

Harley-street, W., July 12th. H. BATTY SHAW.

THE FUTURE OF PHARMACY

To the Editor of THE LANCET

SIR,—In a letter in your issue of July 13th, under this heading, Dr. S. C. Dyke questioned a statement which I made in my address to the British Pharmaceutical Conference suggesting that it would be of assistance to the doctor if he could depend upon the pharmacist to undertake certain biochemical examinations. It is not to be expected that my opinions on this question will coincide with those of the Association of Clinical Pathologists. Nevertheless, without engaging in a controversy which is unlikely to lead either of us to alter our opinions, I may perhaps be permitted to record certain matters which are facts rather than opinions which led me to the suggestions contained in my address.

Firstly, the fields of physiology and biochemistry should not be, and to-day are not, the exclusive province of the medical profession. There are distinguished physiologists and biochemists who do not hold a medical qualification. Next, the medical qualification by itself, while conferring obvious advantages upon a worker in these fields, is itself no guarantee of competency in them. Much of the work is essentially chemical work, for which a chemical training and outlook are required. Thirdly, there are to-day pharmacists regularly engaged in the biochemical examination of pathological specimens both in private practice and in hospitals. Again, the pathological laboratory, as Dr. Dyke truly points out, is not the place where a complete diagnosis can be made. Such a diagnosis involves the services of more experts than the chemical pathologist alone, and it is for the physician in charge of the case to make the final diagnosis after he has received reports from the clinical pathologist, the radiologist, the bacteriologist and, it may be, other specialists. It is the function of no one of these to proceed to an *ultimate diagnosis.*

It is considerations such as these which lead me to the conclusion that the medical qualification, although of value, is by no means an essential for persons engaged in this work. I feel myself that one of the most unfortunate tendencies in the medical profession is this refusal to look beyond the pages of the Medical Register. Medicine is rapidly changing, and it is impossible to-day for the medical practitioner to become a specialist in every branch of knowledge which impinges upon medicine. The informed public may well look a little cynically upon a calling which refuses to look beyond its own boundaries and to accept competent qualified assistance, quite apart from quackery, which chances to be outside its own ranks.

I am, Sir, yours faithfully,

F. W. CROSSLEY-HOLLAND,
Chairman, British Pharmaceutical Conference.
Bloomsbury-square, London, W.C., 15th July.

PROGNOSIS OF SIMPLE MOLES AND MELANOTIC SARCOMA

To the Editor of THE LANCET

SIR,—In his article on this subject in your issue of June 15th Mr. Sampson Handley makes the statement that "Though melanotic sarcoma is fortunately a rare disease . . ." quoting the Massachusetts figures in support. The statement presumably refers to the incidence of melanomas amongst the white race in temperate countries; it is certainly not correct if applied to the dark-skinned races in the tropics of Africa. The following figures may be of some interest in this connexion . In these laboratories during the years 1930–35 (ending June 1935) 438 specimens were reported as malignant tumours and of these 31 were melanomas, which is approximately 7 per cent. All these melanomas occurred in Sudanese and were sent in from all parts of the Sudan. Eighteen were from the foot, 7 from other parts of the leg, 4 from the eye, 1 from the breast, and 1 from the tip of the index finger. Similar figures are reported from the Medical Research Laboratories, Lagos.[1] For the years 1930–33 90 malignant tumours were reported, of which 10 were melanomas, all from the foot. The Nigerian workers have previously drawn attention to the predilection of these tumours for the foot, and it is of interest to note a similar disproportionate frequency in the Sudan figures. I am unable to suggest any explanation of this finding, at least for the Sudan cases.

One is led to infer from the statements in the text-books that melanoma is a rare tumour in the negro race —e.g., MacCallum[2] states " . . . we were surprised to find that all the 10 cases of melanoma that were observed at autopsy here were in white persons, although in the course of the 12,000 autopsies in which these occurred the proportion of negroes is high." Ewing[3] says "In the negro melanotic tumours are rarely recorded, but on account of the difficulty of diagnosis it is probable that many are overlooked." The occurrence of melanomas in white or grey horses only was long ago pointed out by Virchow, and a somewhat dubious analogy is often drawn between this observation and the apparently greater incidence of melanomas in white persons. The Sudan and Nigerian figures quoted above are absolutely at variance with the *common belief that melanoma is a rare tumour* in the darkly pigmented races. In this connexion it is better to avoid the term negro, as although ethnologically the bulk of the Sudanese are not negro there occurs a considerable mixture of negro blood through the country.

I think it is reasonable to conclude that a tumour which constitutes from 7–12 per cent. of all malignant growths must be regarded as comparatively common; and indeed suggests a greater liability of the darker skinned races of Africa to this neoplasm.

I am, Sir, yours faithfully,

Khartoum, June 29th. E. S. HORGAN.

GOLD TREATMENT OF ASTHMA

To the Editor of THE LANCET

SIR,—In continuation of my letter which you published last August I would like to record our further progress in the treatment of asthma with gold preparations. A hundred cases have been treated, 60 of them at the Kasr-El-Ainy Hospital under the care of Dr. H. Abu Khatwa, resident registrar, and the sum total of our experience can be expressed in one sentence: In order to get the full benefit of the treatment, one must eliminate all obvious causes of irritation before instituting it; and unless this is done no effect whatever can be expected from the drug.

I feel sure that in all cases of failure there must have been some cause of irritation which we could not identify, and which has thus remained in operation and prevented success. The causes we have come across most often, and which were eliminated before the treatment was made successful, were: (1) Sinusitis (purulent or catarrhal), nasal polypi, and other irritative conditions of the nasal mucous membrane. (2) Sluggish liver—conditions spoken of by French authors as "insuffisances hépatiques." In these cases not only does the treatment fail, but the gold cannot be tolerated and complications of a dangerous nature may appear. Chronic cholecystitis and gall-stones can become contra-indications, leading to failure or intolerance. (3) Intestinal parasites (particularly amœba but also ankylostoma and ascaris). In some of our cases four injections of gold were given without the least response, but when we got rid of the parasite, the asthmatic attacks disappeared without any further trouble.

I must also say a few words about the complications that sometimes developed owing to intolerance of the drug. As mentioned in my first letter, fever was very common, especially in summer, but was never serious, and usually passed off in a few hours. The most important complication, however, is dermatitis, which may be very severe, and is accompanied by high fever. Happily we have had it only in two cases, and both ultimately recovered. Jaundice has appeared in two private cases, lasting about three weeks and then passing off. I still find extract of liver, given subcutaneously and accompanied by intravenous injections of thiosulphate of soda or magnesium (10 per cent.) in doses of 10 c.cm., to be the best treatment for all complications arising from intolerance of gold.

Of the 60 cases treated in the hospital 6 have shown relapses after a year's freedom from attacks; and so have 2 out of 40 in my private practice. In all these cases a second course of treatment has given lasting relief. Four of my private patients had heart diseases, and they were all relieved of asthmatic attacks after having stood very well a course of four injections each. For no apparent reason 6 of the 60 hospital cases and 6 of the 40 private ones did not respond at all to the remedy.

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[1] Annual Reports on the Medical and Health Services, Nigeria, 1930–33.

[2] MacCallum: A Text-book of Pathology. 1932.

[3] Ewing: Neoplastic Diseases. 1931.

I am, Sir, yours faithfully,

G. P. G. Sobhy,

Associate professor of medicine in the Egyptian University.

Cairo, July 3rd.

GOLD TREATMENT OF TUBERCULOSIS

To the Editor of The Lancet

Sir,—In reply to Dr. Shaw's criticism of our paper, we cannot see any force in his objection to the type of case we used for the test. Does he seriously consider that the administration of gold to our moribund cases and to cases in which the progress was eminently favourable would have improved the value of our statistics?

Actually in the most significant period, 1932–34, out of 299 cases 71 were hopeless and 81 were mild cases. The inclusion of these admittedly dilutes the statistical evidence for good or ill, but does not necessarily falsify it compared with the "no gold" series. As regards dosage there is no mystical significance in his figure of 5 g. considering our patients' weights varied between six and twelve stones. Some of our patients received less than this amount and some more, all depending on reactions and progress based on clinical and radiographical observations.

We did not mention our repeated radiographical investigations, as this is as much a routine of sanatorium treatment nowadays as taking a patient's temperature. Our paper was headed a statistical study and we confined our remarks to that aspect only. Dr. Shaw does not seem to be aware that Crysalbin and Sanocrysin are different trade names for gold sodium thiosulphate as he accuses us of giving all our injections *intramuscularly* (his italics). This compound is not suitable for intramuscular injection. Actually 78 per cent. of those treated received intravenous gold sodium thiosulphate. A very large number of publications favourable to gold treatment in tuberculosis by many "authorities" are totally devoid of any control series and are of no evidential value as to its benefit.

In spite of Dr. Shaw's castigation, we unrepentantly maintain that, if in a series of 299 cases one half receive a new treatment, some improvement on previous results should be shown, if the treatment is of any striking value, compared with a similar control series, more especially when we showed that the new treatment was applied during a period when the fatality of the disease was tending to fall in this age-group compared with the former group. When we find that in the pre-gold period quiescence or improvement of disease occurred in 66·2 per cent. of the patients treated by sanatorium methods, whilst during the period 1932–34 when half our cases received gold the corresponding figure was only 63·3 per cent., we cannot view our results with any satisfaction.

We are, Sir, yours faithfully,

B. A. Peters,
C. Short.

Pill, near Bristol, July 15th.

GOLD TREATMENT OF RHEUMATOID ARTHRITIS

To the Editor of The Lancet

Sir,—With the general tenor of Dr. Hartfall and Dr. Garland's article we find ourselves in complete agreement and we note they confirm our previous work in stating that chrysotherapy is the most important form of treatment in rheumatoid arthritis.

We at our clinics have always used the intramuscular method and we believe that fatalities can be avoided if these principles are borne in mind: (1) to start with small doses; (2) to observe carefully the patient's reaction and, should there be any, to avoid larger doses; (3) to use the intramuscular route; (4) to space the doses correctly. We have described our technique fully in the *Practitioner* of June, 1935.

We believe that small total doses frequently administered are preferable to larger massive doses, and it has been our practice to give courses with a maximum of 1·3 g.—this to be followed by an interval of 4–6 weeks before the second course is attempted. It must be emphasised that the treatment is a long one and will last *at least* nine months.

By these methods we have had no anxiety in any case—though there have been skin reactions of various types in a few cases. We agree with Dr. Hartfall and Dr. Garland that thiosulphate, liver, &c., seem of little use once there has been a reaction, but are of the opinion that collosol sulphur in drachm doses at night is a very helpful adjuvant.

We feel the analogy of syphilitic treatment is very apt. Arsenobenzol is also dangerous if given unsuitably or in large doses. Skin and general reactions likewise occur—and like chrysotherapy the treatment is long and numerous courses are required.

In conclusion, our results to date which we hope soon to publish are most encouraging. Several completely disabled cases are now resuming their activity though perhaps in a modified form. Patients themselves who are very good judges of their progress in this condition state they feel better, have less pain and more movement. Clinically there can be no doubt at all of the value of the treatment in many of these intractable cases—many of whom had had all the usual remedies over a long period of time before chrysotherapy. It is only fair to add that chrysotherapy is a method and we use in addition physiotherapeutic measures where indicated. Many of our cases, however, have not had this form of treatment.

We do not think gold is more dangerous if used as above than arsenic compounds or even digitalis; but like all therapeutic measures the physician must learn the uses of his drug—in the right case its dose and its reactions.

Finally, we would add that although no curative measure is obtained in osteoarthritis, the treatment seems to relieve pain and improve the general condition. We must stress the point that some pain is experienced during treatment—indeed many of our best results have suffered in this way. This is an indication to continue and not to give up. We feel the last attitude is responsible for some of the unsuccessful results which have been obtained.

I am, Sir, yours faithfully,

Gerald Slot,
P. M. Deville.

Harley-street, W., July 13th.

AN EPIDEMIC OF HERPES

To the Editor of THE LANCET

SIR,—Herpes of the lip and face is not perhaps unusual among individuals exposed to sun rays, but an epidemic appears to me of some interest. The manager of a clothing factory asked for my advice, as 14 of his employees were suffering from swollen lips and a rash round the mouth. Two had been to hospital and reported that they had been told they had erysipelas.

On inquiry at the factory the condition was obviously one of herpes of the lips and face. The employees on the previous Saturday had been taken for a day's outing to the sea, returning at midnight in an open charabanc. The occurrence of this condition among approximately 24 per cent. of persons exposed would appear to be high. The sufferers were of varying types of complexion, and some had bathed, some had eaten shell-fish, and some had done neither. All complained of the condition commencing with irritation on the Monday evening.

I am, Sir, yours faithfully,

JOHN C. BRIDGE,
Senior Medical Inspector of Factories,
Home Office, S.W.
July 13th.

HEADACHES

To the Editor of THE LANCET

SIR,—Respect for the views of Sir Edmund Spriggs, and admiration for the contents of his article on headaches, do not prevent me asking for a further explanation of certain categories into which he places the nervous patient. He distinguishes three groups: the first being "neurotic" (subdivided into "nervous" and "neurasthenia"); the second being "tired" (subdivided into "nervous exhaustion" and "overtired"); and the third being "worried," with four subdivisions. His brief descriptions do not convey any clear idea of symptomatology.

I feel sure there are many who would appreciate a more complete discussion of his terminology, explaining in particular what he means by "neurotic," "nervous," "neurasthenia," and "nervous exhaustion."

I speak, Sir, as a clinician anxious to understand something of the value of the nervous factor. Sir Edmund Spriggs's classification does not seem in accordance with any modern concepts. Perhaps he will define what his terminology involves.

I am, Sir, yours faithfully,

Wimpole-street, W., July 6th. JOSEPH GEOGHEGAN.

BLEEDING OF TRANSFUSION DONORS

To the Editor of THE LANCET

SIR,—May I make the following observations on the method of bleeding transfusion donors described by Dr. Marriott and Dr. Kekwick in your last issue? (1) In my experience, a special needle requiring the use of novocain for its insertion is never necessary, an ordinary wide-bore serum needle being perfectly adequate if carefully chosen. With this, a pint of blood is easily withdrawn without the use of suction. In view of the fact that he may be called upon again within a short period, a volunteer donor should not be asked to give more than this. It may also be mentioned that he is always informed by the Red Cross Society of the amount he has given. (2) In my own experience, though suction may with advantage be employed, the use of too drastic a suction defeats its own end. The suction of a rubber bulb of moderately thick wall is all that is necessary to give a stream of blood the size of an ordinary lead pencil. Stronger suction cannot make a vein yield more blood than its lumen will carry, and only tends to suck its walls together, thus diminishing or even occluding the lumen. It also gives rise (as I can testify from my own experience as a donor) to a highly unpleasant vibration in the vein, the walls of which are converted into a sort of reed by the suction. This happens frequently, even if the suction is only that provided by a rubber bulb with a fairly thick wall.

While suction may be employed with advantage, I cannot agree that it should be more than that provided by a rubber bulb such as Dr. Marriott and Dr. Kekwick condemn.

I am, Sir, yours faithfully,

J. W. SHACKLE, M.R.C.S., L.R.C.P.

Grosvenor-street, W., July 15th.

"ULTRA SHORT WAVES"

To the Editor of THE LANCET

SIR,—In view of the interest in claims concerning the so-called specific action of "Ultra Short Waves" (i.e., an action not accountable as a heat effect, and having a short wave length dependence), and more especially that high-frequency currents corresponding to a wave length of 3·4 metres have a specific effect on rat tumours, Dr. H. J. Taylor has carried out a series of observations at the St. John Clinic and Institute of Physical Medicine which led him to conclude that there is no such specific effect. Wave lengths of 3·4 metres and 4·5 metres are effective in destroying small rat tumours growing in the flanks of the animals, at the same time producing damage to the surrounding tissues.

The tumours may be necrosed equally well by both these wave lengths and also with vastly different doses of ultra short waves. For example, a small dose of U.S.W. without cooling is just as effective as a high dose with cooling. The results will be published later in detail, but I would like to point out that the conclusion reached is that the effect is a heat effect, a conclusion which confirms that of Dr. A. Eidinow, based on the nature of the pathological changes produced by ultra short waves.

I am, Sir, yours faithfully,

London, S.W., July 15th. LEONARD HILL.

THE INCIDENCE OF PROCTITIS IN GONORRHŒA OF FEMALES

To the Editor of THE LANCET

SIR,—I was much interested in the article on this subject by Dr. Clements and Dr. Hughes in THE LANCET of July 6th, 1935. I have been aware of the danger of missing this infection ever since I have had charge of the female V.D. department at Guy's from 1917. It has always been part of the routine at this clinic to take films and cultures from the rectum in suspected cases of rectal gonorrhœa and, in more recent years, the majority of cases attending for vaginal discharge have had initial rectal tests taken. The percentage of positive cases has been markedly lower than that obtained at St. Thomas's. This may be due to the fact that if the initial rectal tests are negative and no further signs and symptoms develop, the rectal tests are not repeated until final tests for cure are made. In the definitively positive cases of rectal infection, the patients almost invariably have symptoms such as discharge, soreness, and feeling of weight and "piles." A small inflamed tag at the anus leads one to suspect rectal gonorrhœa. In suspected cases a small proctoscope is passed and material taken from obviously infected parts, which, at the same time, are touched lightly with solid $AgNO_3$. This treatment is followed up by the frequent use of suppositories of acriflavine or protargol.

In future, intermediate rectal tests will certainly be taken, as from the report from St. Thomas's Clinic it would seem that possibly cases have been overlooked.

I am, Sir, yours faithfully,
MORNA RAWLINS.
Devonshire-place, W., July 16th.

THE UNHAPPY COLON

To the Editor of THE LANCET

SIR,—Dr. Hurst would have us regard all cases of constipation as due to inefficiency of the conditioned reflex established in infancy, by sitting the child on the pot and maintained by the familiar associations that in later life supersede and replace this earlier stimulus. In his opinion, therefore, humanity must be educated in order to carry out efficiently this physiological act.

That the act is a reflex one is, of course, true. But why have to call on artificial stimuli? Surely the periodic activity of the colon from *start to finish* is the natural response to the taking of food. Why should the gastro-colic reflex action end at the pelvi-rectal junction? The upper valve of Houston may have some value in promoting control of the final expulsive act and throw less strain on the anal sphincter, but not being a true sphincter it cannot be intended to regulate the output in the manner Dr. Hurst describes.

Observation of the habits of infants before they are introduced to the once-a-day pot, of humanity in its more primitive state and of the highest apes, shows that the wave of contraction set up in the colon in response to the taking of food suffices to fill the rectum and that there is no obstruction to the completion of the act. Inhibition is deliberately set up in the nurseries of civilisation and maintained in early life, and this is the real origin of constipation.

I am in thorough agreement with Dr. Hurst as to the perniciousness of the habitual aperient. But education must be along the lines of suitable dietary from infancy onwards, not in setting up artificial stimuli and "conditioning" a natural process. After all, we most of us have an efficient anal sphincter to enable us to cope with the requirements of decency and order.

I am, Sir, yours faithfully,
S. HENNING BELFRAGE.
Seymour-street, W., July 16th.

PUBLIC HEALTH

Another Report on Maternal Mortality and Morbidity

AT a time when maternal mortality is much under discussion the publication of a report[1] by two medical officers of the Department of Health for Scotland is particularly opportune.

The authors, Dr. Charlotte Douglas and Dr. McKinlay, assisted by a clinical subcommittee, base their findings on an analysis of 2527 maternal deaths in Scotland since Oct. 1st, 1929, and an inquiry into all births during a six-monthly period, to the number of 39,205. The analysis of the maternal deaths follows the lines of the interim and final reports of the Ministry of Health's Departmental Committee and the results obtained are similar. The proportion of deaths attributed to various causes do not differ except that those for abortion and for eclampsia are somewhat lower, and for the other toxæmias of pregnancy higher, than in England and Wales. Among the "associated deaths,"—i.e., those due to diseases aggravated by pregnancy—the proportion attributed to renal disease was very much higher than in England. The "primary avoidable factor" was evaluated as in the English series and the percentage of "avoidable" deaths was considered to be 58·7, as against 46 in England and Wales and 65·8 in New York.[2] Allowing for personal variations in the arbitrary standards chosen, this confirms the view that about half of the maternal deaths were "avoidable." It is necessary to emphasise, however —and the report is not very clear on this—that it by no means follows that half the mothers would have been saved if this primary departure from the optimum procedure had been avoided. For example, a death from obstructed labour due to contracted pelvis would be classed as avoidable if the patient had had no antenatal care, but it cannot be assumed that such care would in fact have saved her life; she might have died during a Cæsarean section. At the same time the case-histories reproduced leave no doubt that maternal mortality in Scotland could be largely reduced.

Of the 58·7 per cent. of "avoidable" deaths, 21·6 were attributed to the negligence of the patient, and 37·1 to faulty technique of the attendant (including doctor, midwife, and institution). The patient's responsibility usually lay in failure to obtain antenatal care, and in 28 per cent. of fatal cases adequate supervision was lacking—more often than not because of the patient's indifference. In this group the largest subdivision is made up of cases of chronic renal disease, the insidious and painless nature of which does not force the patient to seek medical aid. Some of the women who died had refused therapeutic abortion, and it is noteworthy that in none of these cases did the fœtus survive. The investigators find that the number of antenatal beds available was "grossly inadequate," and although they did not observe that lack of food was a factor in maternal mortality, they bring out the difficulty of providing a special diet under home conditions—a difficulty which made institutional treatment a necessity in a majority of cases of the toxæmias of pregnancy.

Of the women who died at confinement (the "intranatal" class) it is stated that "in the main groups of sepsis, failed forceps, shock, and post-partum hæmorrhage, there is little doubt that in the majority an undue desire to 'hurry' the confinement was at the root of most of the troubles." Where the attendant was not at fault it was the relatives rather than the patient herself who refused to coöperate—a statement which will be borne out by every general practitioner who undertakes midwifery. As to the postnatal group two points are made. First, that obvious sepsis was often unacknowledged and the patient kept at home far too long; and secondly, that cases have been traced to children recently discharged from hospitals for infectious diseases and other persons with septic foci.

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[1] Report on Maternal Morbidity and Mortality in Scotland. By Charlotte A. Douglas, M.D., and P. L. McKinlay, M.D. 1935. Edinburgh: H.M. Stationery Office.

[2] Maternal Mortality in New York City. By the N.Y. Academy of Medicine, New York: The Commonwealth Fund. London: Oxford University Press. 1933.

General comparisons between the group of deaths and the control group of confinements throw a new light on the effect of parity on risks of pregnancy. It appears that while primiparæ have an excess risk amounting to 13 per cent., the fifth and subsequent pregnancies show *a mortality greater than the first*, and increasing steadily with the number of pregnancies. (It has hitherto been thought that it is not until the eighth pregnancy that the risks are greater than the first.) It is concluded that the effect on the maternal mortality-rate of a falling birth-rate is therefore generally favourable rather than the reverse, although certain causes of death such as eclampsia and accidents of childbirth would be adversely affected by the increase in the relative number of primiparæ. Other conclusions of general interest are that overcrowding has no adverse influence, rather the reverse, and that bad health before pregnancy and a deterioration of health during pregnancy was much more conspicuous among the women who died than among the others.

A consideration of the maternal mortality-rates in Scotland from 1911–30 shows the highest rates to have been in the three border counties and the lowest in equally rural, widely separated areas. Regional comparisons, however, show less variation than in the death-rates from many other diseases. There are gross variations in the rate from year to year, suggesting that comparatively static factors such as the standard of obstetric care are not so important as other considerations, among which might be meteorological conditions or the prevalence of infectious diseases.

The recommendations made by Dr. Douglas and Dr. McKinlay include a general warning against the dangers of undue publicity, and they support a closer linkage between midwives and local authorities "as, for example, by a local authority midwife service." Antenatal, intranatal, and postnatal supervision should be afforded by the same medical attendant wherever possible, and "if, at any stage, a pathological condition is failing to respond to treatment, and if the necessary steps for the patients' safety cannot otherwise be taken, the medical officer of health should be informed at once." Local authorities should consider the institution of a voluntary system of notification of pregnancy, as at Huddersfield, and grants of milk should be made rigidly conditional on adequate antenatal supervision. "It is for consideration whether it is practicable to make the obtaining of adequate antenatal care an essential condition of payment of maternity benefit." As far as the conduct of confinements is concerned it is strongly recommended that, wherever practicable, the advice of a recognised obstetrician should be obtained before any procedures other than minor instrumental or manipulative interference is attempted. Practical instruction in contraceptive methods should be available for women for whom further pregnancies would be dangerous.

Food-poisoning at Nelson

Dr. R. G. Markham, medical officer of health for Nelson, Lancashire, provides us with information about the recent outbreak of food-poisoning in the town. The first intimation of the outbreak was, he says, received on June 28th, and the onset of all the cases seems to have been within the period June 28th to July 1st. So far as can be ascertained about 173 cases occurred, and inquiries showed a common source of infection in cooked meats (pressed beef, stew, stew and cow-heel) which had been made up at one central depôt. The unsold remainder of the suspected carcass of beef was seized and portions sent for bacteriological examination, and after this carcass and the prepared foods had been withdrawn from sale and destroyed the outbreak subsided. The illness began from 12 to 24 hours after consuming the food, the symptoms being *acute abdominal pain accompanied by vomiting and diarrhœa.*

There were three deaths in Nelson, all on July 4th, and bacteriological examination carried out by the Ministry of Health revealed the presence of *Bacillus aertrycke* in all the organs of those who died. This bacillus was also isolated from specimens of food and beef sent for examination.

Anthrax in a Shaving-brush

The inconspicuous vigilance of the public health service is illustrated by a series of events which came to light at an inquest last week in London on a man named John Banks who died from anthrax on July 6th. A malignant pustule had developed on his cheek on July 3rd, and his shaving-brush was found to contain anthrax spores and bacilli. According to the widow, the brush had been bought at least two years previously and it proved somewhat similar to—though not definitely identifiable as—a brush missing from a consignment of twelve seized in June, 1932, all of which were found to contain anthrax spores. The fact that this consignment was infected was ascertained when a man died from anthrax contracted from a brush bought in Stepney, and it was then discovered that some from the same batch had been sold to two shops in Lambeth. It proved possible to collect all of these except one, which had been bought the day before by a chance customer who could not be traced. The shop from which it was sold is in the same street as Banks's home and only two or three minutes' walk distant. In 1932, when the missing brush could not be found, the hospitals in the district were warned to be on the outlook for a malignant pustule in order that no time should be lost before serum was given, but as no case occurred, it was believed that the customer was not a Lambeth resident.

Dr. A. G. G. Thompson, medical officer of health for Lambeth, to whom we are indebted for these particulars, informs us that considerable difficulty was experienced in tracing the source of supply to the wholesale dealer in Stepney in 1932, but as the result of careful inquiry it transpired that a shopkeeper now in Lambeth bought the brushes shortly after the war. They were overlooked at the back of a drawer, and when his business in Stepney was given up in 1930 they were sold with the rest of the stock. The original owner stated that he had intended to destroy them but forgot to do so. The country of origin had also been forgotten, but from various indications there seemed little reason to doubt that they were of German or Czecho-Slovakian origin.

A possible fault in the chain of evidence is that John Banks shaved with the brush at least once after the pustle was noticed, and it is arguable that the brush was infected from the pustule and was therefore not the primary cause. Banks was a small cobbler, and had purchased some leather on July 2nd. As the leather was tanned and dressed ready for soling, it did not seem to be a likely source of infection, but samples nevertheless were taken for examination with the expected negative result. Banks almost always shaved himself, and the last time he had been shaved by a barber was at least a fortnight before the onset of his illness; after inquiry no suspicion was attached to the barber's utensils. Hence the shaving brush appears to have been the source of the disease; but its prolonged use without giving rise to infection is amazing.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 6TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1485; diphtheria, 826; enteric fever, 49; acute pneumonia (primary or influenzal), 448; puerperal fever, 43; puerperal pyrexia, 107; cerebro-spinal fever, 16; acute poliomyelitis, 9; acute polio-encephalitis, 1; encephalitis lethargica, 4; dysentery, 11; and ophthalmia neonatorum, 95. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 9th was 2685, which included: Scarlet fever, 768; diphtheria, 984; measles, 40; whooping-cough, 386; puerperal fever, 25 mothers (plus 8 babies); encephalitis lethargica, 271; poliomyelitis, 1. At St. Margaret's Hospital there were 25 babies (plus 14 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there were no deaths from small-pox or enteric fever, 12 (0) from measles, 1 (1) from scarlet fever, 18 (3) from whooping-cough, 19 (0) from diphtheria, 36 (7) from diarrhœa and enteritis under two years, and 13 (0) from influenza. The figures in parentheses are those for London itself.

Of the fatal cases of measles 5 were in Liverpool and 3 in Sunderland. Liverpool also reported 3 deaths from diarrhœa and enteritis, and there were 3 others in Hull and 2 each in Manchester, Sheffield, Birmingham, and Stoke-on-Trent. Three of the deaths attributed to influenza were in Manchester and 2 in Huddersfield.

The number of stillbirths notified during the week was 265 (corresponding to a rate of 37 per 1000 total births), including 37 in London.

PANEL AND CONTRACT PRACTICE

A Health Insurance Scheme for British Columbia

It seems likely that British Columbia will be the first of the overseas dominions to adopt compulsory health insurance. The question was considered some years ago by a Royal Commission, who in 1932 reported that they were satisfied that the people of British Columbia were "overwhelmingly in favour of a compulsory health insurance and maternity benefit scheme," and recommended that such a scheme should be established at an early date. The government of the province have since given the subject the most careful study from all points of view, and have now produced a draft Bill, which is intended to serve as a basis of discussion by all interested parties with a view to formulating a definite measure for adoption in the next session of the legislature. The Bill, which is accompanied by an explanatory memorandum, is evidently the result of some hard thinking, and it presents points that merit the attention of all who are interested in the progress of health insurance.

The explanatory memorandum emphasises the need for health insurance. It is believed that the conditions in the province do not differ materially from those prevailing in the United States as found by the extensive researches of the Committee on the Costs of Medical Care, which showed that while 1385 days of hospital care per year were required for every 1000 persons, only 746 days were actually given; that 5650 medical attendances were required as against 2391 given; and that although all the 1000 persons required dental care during the year only 241 received it. The position of the persons and agencies providing medical care is also unsatisfactory. In 1933 nearly one-half of the doctors engaged in private practice in British Columbia and 69 per cent. of the dentists had net incomes of less than $2000 (£400). And it is stated that "hospital boards throughout the province are at present at their wits' end as to how they can finance their institutions."

To remedy this state of things the Government propose to set up a health insurance system to be administered by a central commission, which will consist of five government officials, including two doctors—the provincial health officer, and the director of medical services. There will be two chief executive officers, both of whom will be members of the commission: the administrator of health insurance, who will be responsible for the business administration and enforcement of the law, and the director of medical services, who must be a qualified medical practitioner and who will organise, direct, and control the provision of the medical benefits granted under the scheme. Both officers will be appointed by the Lieutenant-Governor, but the appointment of the director of medical services must be with the approval of the College of Physicians and Surgeons of British Columbia. The commission will be advised by an advisory council representing the various interests concerned, and there will be a medical committee, nominated by the College of Physicians and Surgeons of British Columbia, charged with important functions in relation to the discipline of the medical service, and similar committees representing dentists, pharmacists, nurses, and hospitals.

Under the scheme insurance may be applied to such classes of employees earning $200 per month or less, and their dependents, as may from time to time be determined by the commission. Persons working on their own account and earning not more than $200 per month may insure as voluntary contributors, and the medical benefits of the scheme may be extended to destitute persons and their dependents. The employee will pay a contribution not exceeding three per cent. of his wages, and the employer will contribute an amount equal to two-thirds of that paid by the employee. The Government will make contributions sufficient to cover the cost of medical benefits provided for the destitute and half the cost of administering the scheme. The insured persons, including the destitute, will be entitled to an extensive range of medical benefits, comprising general practitioner, maternity, specialist, dental, nursing, laboratory, and pharmaceutical services, hospital care, and such preventive services as may be decided upon by the commission. For insured persons other than the destitute there will be a cash benefit payable during incapacity for work, beginning after the first week of incapacity and continuing for a maximum period of 26 weeks.

Payment will be at the rate of one-half the wages ordinarily earned.

The Bill provides that all qualified doctors, dentists, nurses, and pharmacists shall have the right to give professional services under the scheme if they wish to do so, and the insured persons will be free to choose any doctor, dentist, nurse, and pharmacist on the list of those who have undertaken to serve. These rights may, however, be modified in sparsely populated districts in order to guarantee a satisfactory service. It is estimated that the annual cost of the medical benefits will be $12·50 (50*s.*) per head, of which $3·40 will be set aside for the remuneration of the general medical practitioners, who may be paid either on a capitation or an attendance basis. But for the treatment of the destitute, who now form about one-fifth of the persons who would be eligible for insurance, payment will be at half rates, which the explanatory memorandum states "will not be unfair to the persons and organisations providing medical service, for at present they are doing a great deal of totally unpaid work for the indigents, and there is every reason to believe that, for most medical services, this arrangement can be made."

The inclusion of the destitute among the persons for whom treatment is provided under health insurance arrangements is a feature of the British Columbia scheme that is of special interest, for it carries into effect the policy advocated by the British Medical Association for adoption in this country, although it has not been suggested here that doctors should be paid at lower rates for the treatment of the destitute. Another interesting feature of the scheme is that it will be administered direct by a central commission without the interposition of approved societies or insurance committees. It is thought that this will effect such economies that the cost of administration will not exceed 10 per cent. or possibly 8 per cent. of the cost of the benefits. The draft Bill confers upon the commission wide powers to modify the scheme in various important respects, such elasticity being considered essential to the successful working of an extensive and elaborate system of medical services in a country where the geographical and social conditions vary so widely as in British Columbia. The commission may, for instance, by regulations require insured persons, other than the indigent, to pay as much as one-quarter of the cost of the drugs and appliances prescribed for them. A similar requirement has been adopted in several European countries to check the extravagant use of medicaments. There are other noteworthy points in the scheme, and those responsible for preparing it may be congratulated on their courageous and competent handling of a highly difficult subject.

Some Statistics

An examination of the quarterly statistical statement issued by the London committee is worth while if only to bring to mind the magnitude of the task of providing medical benefit for the insured population. Of the 1,888,956 insured persons in London on March 31st 1,760,219 were included in doctors' lists, 15,739 of them being the resident insured staffs of hospitals and similar institutions: 140 persons were required to make their own arrangements for the receipt of medical benefit, and 896 were allowed to do so; the former are exempt persons whose total income exceeds £250 a year (they pay no contributions but their employers do) while most of the latter are the employees of a hospital, the remainder being in the main persons who desire to obtain homœopathic treatment and others who for various reasons are allowed to obtain treatment from non-insurance doctors. There were 2060 general practitioners and 126 medical officers of institutions on the medical list, who during the quarter notified 65,308 acceptances but suffered 68,105 removals from their lists. The number of medical cards issued was 122,986. Forms of medical record recovered from practitioners numbered 66,472. 7013 insured persons applied for authority to change their local doctors but nearly 2000 of them changed their mind, for only 5061 eventually transferred, this number representing 0·287 per cent. of those whose names were included in doctors' lists. For the twelve months ended March, 1935, 17,812 so transferred, representing a comparable percentage for the year of 1·01.

The pharmaceutical service for the county is provided by 986 chemists in general business, 54 in institutions, and 12 other persons, a total of 1052 contractors who are responsible for 1299 shops within the county and 340 shops elsewhere where London prescriptions may be dispensed. The number of such prescriptions dispensed during the quarter was 2,388,506, costing £77,484 17*s.* 6*d.*, the average total cost per prescription being 7·79*d.*, while the average cost of the 1·35 prescriptions issued per insured person was 10·55*d.*

Insurance doctors still issue prescriptions for appliances which are not "prescribed appliances," and during 1934 a total of 547 such prescriptions had to be disallowed, to the dismay of the doctors who had to be surcharged with their value. The favourite articles in this connexion are eye shades (one-fifth of the total); others in order of popularity are finger- or thumb-stalls, capsicum wool, corn pads or adhesive felt, syringes, glass tubes and rods, down to safety-pins and tweezers. It should be borne in mind that while there is nothing to prevent a doctor from prescribing any drug, however costly, which is reasonably necessary for the adequate treatment of his patients, appliances may be ordered only if they are included in the list of "prescribed appliances" which will be found in the Second Schedule to the Regulations or in the National Formulary.

Housing Schemes and Surgeries

The housing committee of the Leeds Corporation recently asked the local panel committee to assist them in allocating special houses which are being erected for a limited number of doctors on the new housing estates. It was realised that doctors whose practices covered slum clearance areas were suffering hardship but the intention of the corporation to give a monopoly of surgery accommodation to certain doctors, and the consequent restriction of free choice of doctor to insured persons, gave rise to natural objections. Leeds appears to have been clearing slums somewhat drastically, so much so that in one case four-fifths of a practitioner's patients were affected. In one of the new colonies it was estimated that there would be about 3000 houses and some 15,000 people involved; four houses were being specially erected for doctors and dentists and the panel committee were asked to recommend the proper practitioners to whom the accommodation might be offered—a sensible request by the corporation but an embarrassing task for the panel committee. The position is complicated by the fact that doctors who have already taken surgery accommodation on the new estates have done so under the explicit statement of the corporation that the conditions were only temporary and subject to the tenancies being at the decision of the housing committee; clearly this arrangement must be altered in the direction of granting leases for a reasonably long period so as to attract the right type of practitioner. Meanwhile the result of the panel committee's deliberations will be awaited with interest.

A Final Certificate and the Consequences

The London medical service subcommittee has recently dealt with a curious complaint against a doctor. The insured person has been incapacitated almost continuously since 1931, suffering from pulmonary fibrosis and neurasthenia and receiving monthly certificates, but he has been able to work for about a fortnight at Christmas time each year as a temporary post-office sorter. In 1934 he worked from Dec. 14th to 26th and on Dec. 15th he induced the doctor to "sign him off" although the doctor demurred and eventually told him that if a final certificate were issued he would decline to certify him again as incapable of work. The insured person however applied for a certificate on Dec. 29th alleging that since the termination of his temporary work he had again become ill. The doctor declined, whereupon the man obtained treatment and certificates from another doctor, and on Jan. 18th a regional medical officer examined him and found him incapable of work; so on Jan. 21st and 24th he again consulted his doctor who prescribed for him but again declined to issue a certificate. Later he gave written consent to the insured person's transfer to the other doctor's list. The subcommittee stated that it was clear that the whole of the difficulty had arisen out of the insistence on the part of the insured person that he should be provided with a final certificate. There was no evidence to suggest that his condition between Dec. 14th and 26th, when he was doing his annual temporary work, was different in any essential respect from that obtaining during the remainder of the year. There was very little doubt that the sole reason for the insured person's application for a final certificate in this case was in order that he might benefit financially as a result of the wages he would receive as a temporary sorter being in excess of the amount which he would have received by way of disablement benefit. But the doctor had been at fault in issuing a final certificate after the man had gone to work and had committed an error of judgment in saying that he would not issue another certificate. A warning as to the necessity for a strict compliance with the medical certification rules was issued to him. With regard to an allegation that the doctor failed to examine the patient on Dec. 29th the subcommittee were of opinion that, being well aware of the history of the case, and having issued a final certificate on Dec. 15th the doctor was not satisfied on Dec. 29th that any material change in the man's condition would be demonstrated by a detailed examination. It appeared to the subcommittee that the insured person had proved by his own action in accepting work that he was capable of work, and, in these circumstances, they did not think he had any cause for complaint that the doctor refused, on being satisfied that there was no change in his condition, to issue a further certificate of incapacity. The committee adopted the recommendation that the complaint had not been substantiated, but that the doctor had been at fault in issuing a final certificate after the insured person had resumed work. The insured person accordingly has to pay the other doctor's bill, and the doctor who had the trouble of defending his actions will probably insist in future that certificates shall express his own opinion, and not necessarily the desire of his patients, however insistent these may be.

OBITUARY

ALFRED HENRY SPURRIER, L.R.C.P. Lond., C.M.G., O.B.E.

THE death is reported from Zanzibar on July 5th of Alfred Henry Spurrier, whose name is so closely connected with the government and medical administration of Zanzibar. He was born in Colyford, Devon, in 1862, and educated at Guildford Grammar School and the London Hospital Medical School, whence he took the diploma of L.R.C.P. London in 1887. He was for a period at the Gregorian University in Rome, but his long career in the east commenced with his appointment as medical officer to the Eastern Telegraph Company's cable ships in which capacity he assisted in the special deep-sea survey off the mouth of the Congo in the cable ship *John Pender*. He was appointed medical officer at the Company's station in Zanzibar, was present at the bombardment of Zanzibar in 1896 and was decorated by the Sultan for his services. In the following year he conveyed into German territory a usurper and his family, and conducted a tour with the Sultan through South Africa. He became physician in extraordinary to the Sultan who bestowed upon him various decorations, while he acted also as medical superintendent of "Prison Island" sanitary station and as editor of the *Zanzibar Gazette*. Dr. Spurrier was appointed O.B.E. in 1918.

HORACE MANDERS, M.D. Brux., F.R.C.S. Eng.

THE death occurred on July 5th at Chesham Bois of Lieut.-Colonel Horace Manders in his eighty-third year. He was born in Canterbury, the son of Major Thomas Manders, and educated at Marlborough, whence he went for his medical education to St. Mary's Hospital, London. There he was house surgeon and afterwards house surgeon at Canterbury Hospital. He studied for a time at the Beaujon Hospital, Paris, became interested in electrotherapeutics, and held an appointment for a time in this subject at the East London Hospital for Children. He was at one time medical officer at the hospital at Dvinsk, Latvia, while during the Boer War he saw considerable service in South Africa and was made an honorary captain in the army, and held the rank of lieut.-colonel in the 4th Battn. of the Royal Berkshire Regiment. Colonel Manders married Louisa, daughter of the late Mr. H. P. Goode of Haverfordwest and Colonel Horace Craigie Manders, A.D.C. to the Viceroy of India, is his son.

DAVID SAMUEL, M.R.C.S. Eng., L.R.C.P. Lond., J.P.

THE death occurred recently at Skewen of Dr. David Samuel, who was well known both for medical and public services in South Wales. He was born at Llanelly in 1868, was educated at the Athenæum school, a school in Llanelly at that time, and went to St. Mary's Hospital, London, for his medical education. He qualified with the English double diploma in 1869, and after practising for a short time at Port Talbot settled down at Skewen, where for the rest of his professional life he carried on successful general medical practice, giving special attention to ophthalmic work. He had a keen clinical instinct, was devoted to his work, and had the faculty of becoming the friend as well as the doctor to many of his patients. He was medical adviser to several local industrial concerns, including the National Oil Refineries and the British Tanker Company, while he also interested himself in the work of the St. John Ambulance Brigade and established the first Red Cross Brigade in the Neath division, which gave conspicuously good service during the war. He was J.P. for the county of Glamorganshire.

Dr. Samuel married Edith, second daughter of the late Richard Richards, of Aberavon, who survives him.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

In the House of Lords on July 10th the Housing (Scotland) Bill was read a second time.

In the House of Commons on July 10th, the St. Bartholomew's Hospital Bill was read a second time.

The West Riding of Yorkshire Mental Hospitals Board (Superannuation) Bill was read the third time.

In the House of Commons on July 12th, the University of Durham Bill passed through Committee without amendment and was read the third time. The money resolution in connexion with the Bill was also agreed to.

The Diseases of Animals Bill was considered on report and read the third time.

Balconies to Working-class Flats

In the House of Lords on July 15th the Housing Bill was considered on report.

The Earl of Dudley moved an amendment to clause 31 (Exchequer contributions towards provision of flats on sites of high value) to ensure that the approval of the Minister of Health should not be given to flats for the working-classes unless he was satisfied that each flat in a block exceeding three stories in height was provided with a balcony. He said that medical evidence showed that in the case of families living in the top stories of flats, infant children suffered considerably because their mothers were unable to take them out into the air and sunshine Architectural and technical research showed that the cost of erecting balconies on the high flats would come to very little. Since this matter was raised on the Committee stage of the Bill he had consulted the Minister of Health, with his medical and architectural experts. He understood that the Minister recognised the desirability of such balconies but that there were certain difficulties in the way of making this provision statutory. The Minister, however, was willing to give an assurance that he would emphasise the desirability of the provision of these balconies in a circular to the local authorities. Recognising the genuine sympathy of the Minister he (Lord Dudley) thought that that would meet the case he had in mind

Viscount Halifax, Secretary of State for War, said he could give the assurance which Lord Dudley desired. The Minister of Health would see to it that this matter was mentioned in the Circular which it was proposed to send to local authorities.

The amendment was withdrawn and the Bill passed through the report stage.

Health Services in Aden Protectorate

In the House of Lords on July 15th the Earl of Plymouth, replying to a question by Lord Lamington on the affairs in the Arden Protectorate, said that the system which already existed of training certain natives in the protectorate in elementary hygiene and health service was being extended. This training had resulted in the setting up of what might be termed native dispensaries which were necessarily of a somewhat elementary nature, but which were able to do valuable work. These dispensaries were supervised by the political officers.

Health Insurance Bill: Maternity Benefit Concession

In the House of Commons on Monday, July 15th, the National Health Insurance and Contributory Pensions Bill, as amended in Committee, was considered on Report.

On clause 1 (Amendment of Section 3 of Insurance Act with respect to free insurance period and extended insurance period),

Sir Kingsley Wood, Minister of Health, moved an amendment to provide maternity benefit to insured persons during their extended insurance period. He said that a general desire was expressed in the Committee stage for this concession. The House would appreciate his desire not to place a further charge on the funds of the approved societies who had already so willingly undertaken to bear their share of the considerable cost of the benefits made available under the Bill. Moreover, it was difficult to forecast with any precise accuracy the cost of this proposal, as it depended on so many uncertain factors, including the number of persons who would pass into the extended insurance period and the birth-rate prevailing among such persons. A close investigation had been made into the finance of the health insurance scheme with all these matters in mind, and particularly modifications had been introduced into the Bill in connexion with the setting up of the Unemployment Arrears Fund. As a result they had found a source from which the additional cost could be met—namely, the balance of the unclaimed stamps money, which was not under the Act required to be paid to the Central Fund. Therefore he (Sir Kingsley Wood) was able to meet the wishes of the House and at the same time not cast any further burden on the funds of the approved societies. He was very glad to be able to secure to insured persons in the extended period not only medical benefit and additional treatment benefits, but maternity benefit as well. (Cheers.)

The amendment was agreed to and four consequential amendments were made.

On the motion for the third reading of the Bill,

Sir Kingsley Wood said it was satisfactory to know that those who had elected as voluntary contributors to continue their insurance would not suffer any disadvantage from having taken that course. They would be able, on complying with the usual conditions, to obtain the benefits now given to unemployed persons in connexion with the continuation of insurance. He was also glad that a number of amendments had been made in this Bill which would facilitate the task of the consolidation of the Statutes respecting National Health Insurance. The Bill certainly secured to an insured person who had occasional periods of unemployment not exceeding 21 months in duration should not suffer any reduction whatever in benefits to which he or she might be entitled. His arrears would be completely excused and the benefit periods for a person would be treated in just the same way as if he had been in continuous employment. This would be a real and welcome benefit affecting some 5,000,000 insured persons. The Bill went further and provided for the still more unfortunate person who suffered from prolonged unemployment. Any person who had been insured for 10 years before becoming unemployed would be entitled to medical and maternity benefits and his old age and widows' and orphans' pension would be maintained unimpaired as long as his unemployment continued. It was all the more satisfactory that in making these changes the financial stability of national insurance would not be in any way jeopardised, and as far as approved societies were concerned, not only would they be of great value to those members who unhappily suffered from unemployment, but would result in a great simplification of the working of National Health Insurance.

The Bill was read the third time and passed.

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HOUSE OF COMMONS

WEDNESDAY, JULY 10TH

Meals for Necessitous Children

Mr. Cleary asked the Minister of Labour the approx-mate amount saved, firstly in Liverpool and secondly the country, by the action of the Unemployment Assistance Board in making deductions in respect of meals granted to necessitous children.—Lieut.-Colonel Muirhead, Parliamentary Secretary to the Ministry of Labour, replied : The Board inform me that no information s available as to the aggregate effect of taking into account ree meals provided at school to children in applicant's ouseholds. As the hon. Member was informed on uly 3rd, there are several classes of cases in which the Board ignore such meals. In the remaining cases in which meals are taken into account to a moderate extent, no onsideration of saving to the Exchequer arises.

Mr. Cleary : Is the hon. gentleman prepared to make an nquiry into this subject in view of the fact that the policy f the Unemployment Assistance Board is militating gainst the policy of the Board of Education which ncourages the granting of meals in industrial areas articularly ?

Lieut.-Colonel Muirhead : I will certainly consider it.

THURSDAY, JULY 11TH

Hospitals and the Lotteries Act

Lieut.-Colonel Acland Troyte asked the Home ecretary whether he could give any estimate of the mount of money which would be lost annually to hospitals s a result of the Betting and Lotteries Act ; and whether e proposed to bring in a Bill to amend this Act so as to low small lotteries to be held for the benefit of hospitals nd other recognised institutions.—Sir John Simon plied : I have no information which would enable me to ply to the first part of the question. As regards the cond part, the House considered, during the passage of he Betting and Lotteries Act, 1934, various proposals for galising lotteries in aid of hospitals and other charities ut rejected them.

Lieut.-Colonel Acland Troyte : Is the right hon. gen-eman aware that my local hospital has lost £700 or £800 year owing to this Act, and that it is going very much urther than it appeared the House intended to go ; and will he right hon. gentleman make further inquiries ?

Sir John Simon : My hon. friend will realise that very reful examination was given to this question by the House. must point out to him that as far as I know the Act 1934 did not make illegal any type of lottery which as previously legal.

Lieut.-Colonel Acland Troyte : Does the right. hon. ntleman realise the extent to which it is being applied ?

Viscountess Astor : Is it not the case that it has been ated that these lotteries do more harm than good to the ospitals in the year ?

Sir John Simon : It certainly must be borne in mind at assuming that efforts were made to finance hospitals this country by means of lotteries, it does not neces-rily follow that the existing sources out of which the ospitals receive help would continue to flow.

Sir Wilfrid Sugden : In view of the confused state the betting law, will the right hon. gentlemen consider e possibility of its codification ?

Mr. Paling : Since the passing of the Act has there en any evidence of any great demand for the restoration these lotteries ?

Sir John Simon indicated dissent.

Free Milk for Necessitous Children

Sir William Jenkins asked the President of the Board Education if he would give reasonable discretion to local ucation authorities to grant free meals or free milk to y child where it was within the definite knowledge of e authority that the economic conditions in the child's me were exceptional.

Mr. Thorne asked the President of the Board of Education the attitude of the Board to those local education authorities who were giving free meals or milk merely on the ground of poverty, where the family income was below a certain minimum.—Mr. Oliver Stanley replied : The attitude of the Board in the matter has been set out in a letter dated Nov. 14th, 1935, to the Secretary to the Association of Education Committees. In general, I should agree that the economic conditions of the homes are a factor to which full weight should be given in considering how much importance should be attached to any physical signs or educational symptoms which may be noted by the medical officer or the teacher.

Viscountess Astor : Is it not a fact that over 30 per cent. of the children attending elementary schools are either physically defective or in need of medical observation ? In view of that fact, will not my right hon. friend do all he can to bring in a policy to deal with free milk in schools ?—Mr. Stanley : If the noble lady really wants to know what the figures are perhaps she will put a question down. If she is only giving me information, I am obliged to her.

Maternity and Child Welfare

Mr. George Griffiths asked the Minister of Health the names of the maternity and child welfare authorities which made provision for home helps, and whether his sanction had been given or refused to any authority which had proposed to institute this service within the last two years.—Sir Kingsley Wood replied : There are 133 maternity and child welfare authorities, who according to my latest information have made provision for this service. I will send the hon. Member a list of these authorities, showing those to which sanction has been given within the last two years. There is no case within that period in which sanction has been refused to a proposal to institute this service.

Milk and the Germicide Process

Mr. Rickards asked the Minister of Health whether the new process of adding germicide to milk for destroying bacteria had been brought to his notice ; whether he would have the process tested and investigated ; and consider whether any modification of the Food and Drugs Adulteration Act would be required to permit of milk so treated being sold on a commercial scale.—Sir Kingsley Wood replied : I have recently been informed of a claim to the discovery of a new germicide for milk but I have no knowledge of its composition and no sample has been supplied to my Department. The addition of any germicide to milk would be contrary to the provisions of the Preservatives Regulations and the Food and Drugs (Adulteration) Act, and for the reasons set out in the report of the Departmental Committee on Preservatives in Food I could not contemplate any amendment of the law in this respect.

Brigadier Clifton Brown : In view of the report of the Milk Reorganisation Commission that the Food and Drugs Act should be amended in various particulars, will not my right hon. friend include this matter with other recommendations when this Act is reviewed ?

No further answer was given.

Committee on Nutrition : Welsh Medical Representative

Sir William Jenkins asked the Minister of Health whether he would appoint some medical expert from South Wales or Monmouthshire who had had experience of the depressed areas on the advisory committee who were now considering the question of national nutrition.—Sir Kingsley Wood replied : I have decided, in consultation with my right hon. friend the Secretary of State for Scotland, to appoint the Senior Medical Officer of the Welsh Board of Health to be a member of this Committee.

Beddington Sewage Scheme

Mr. Doran asked the Minister of Health if he was now in a position to give a statement regarding the progress of the Beddington sewage scheme, Croydon ; and if he could assure people resident in the Mitcham, Thornton Heath, and West Croydon districts that all necessary precautions had been taken taken by his department, in conjunction with the Croydon corporation, against a repetition of the insanitary conditions which were experienced in these areas in 1934.—Sir KINGSLEY WOOD replied: I am informed that a scheme for dealing with the whole of the sludge will be placed before the Council at their meeting this month. Any scheme put forward will be fully investigated by the Ministry before sanction is given. Interim measures have been taken to prevent nuisance.

Maternal and Infantile Mortality at Hebburn-on-Tyne

Mr. PEARSON asked the Minister of Health if he had considered the annual report of the Medical Officer of Health for Hebburn-on-Tyne, in which it was stated that the infantile mortality-rate had risen from 86 per 1000 live births last year to 108 this year, and that for every 116 babies born last year a mother died, the average being almost double that for the whole country; and, in view of the seriousness of the problem, will he hold an inquiry into the reasons for this high rate of maternal and infantile mortality.—Sir KINGSLEY WOOD replied: I have received this report and have arranged for one of the medical officers of the Department to visit the district and inquire into the relevant circumstances.

Coloured Population and Public Health in Cardiff

Captain ARTHUR EVANS asked the Minister of Health, if he would consider the Report of the survey of the conditions of the coloured and half-caste population domiciled in the city of Cardiff, conducted by a joint committee of the British Social Hygiene Council and the British Council of the Mercantile Marine, which had been sent to him; and if, in view of the health, employment, and social conditions found to be prevailing, he would take suitable action to remedy the matter.—Sir KINGSLEY WOOD replied: I do not find that I have yet received a copy of the Report to which my hon. friend refers, but if he will arrange for me to be supplied with one, I will gladly consider it, in so far as it refers to matters within the province of my Department.

Captain EVANS: When considering the report in question will my right hon. friend bear in mind the desirability of appointing a small Royal Commission, say of three persons, with wide terms of reference, to investigate all aspects of the difficult and complex problem of coloured people domiciled in Great Britain, especially in dock areas?

Sir KINGSLEY WOOD: That is a very wide question and probably outside my province, but I had better see the report first.

Lunacy and Mental Deficiency

Mr GUY asked the Minister of Health whether he would consider amending the lunacy laws with the object of providing differential treatment for mental deficiency.—Sir KINGSLEY WOOD replied: In England and Wales the Mental Deficiency Acts, 1913 to 1927, make express provision for the ascertainment and treatment of mental defectives, as distinct from persons dealt with under the Lunacy and Mental Treatment Acts, 1890 to 1930. I am not aware of circumstances necessitating action such as my hon. friend suggests.

Backwardness of African Natives

Sir E. GRAHAM-LITTLE asked the Secretary of State for the Colonies whether his Department was now in a position to recommend a grant for a scientific investigation into the causes of physical and mental backwardness in the natives of Kenya Colony, an investigation demanded on repeated occasions by scientific bodies in Kenya and in this country and supported by his excellency the Governor of Kenya Colony.—Mr. M. MACDONALD, Secretary, replied: No, Sir, there are no funds at the disposal of my Department from which any grant for such purpose could be made. The importance of inquiry into the mental and physical development of African natives is recognised. But before deciding what steps should be taken I propose to await the issue of the general investigation which is to be conducted by the African Research Survey, under Sir Malcolm Hailey. I understand that this survey will take the form of a review of African problems, generally and that it will indicate the extent of existing knowledge concerning those problems and the steps to be taken to supply any deficiencies in that knowledge. The inquiry to which the hon. Member refers is only one part of the general survey, and the necessity for any special investigation of it must be considered in the light of its relation to other factors. It is in regard to the inter-relation of African problems and relevant factors that the general investigation will, it is hoped, be of special value in determining the course of future research.

Advertisements of Patent Medicines

Mr. HALL-CAINE asked the Minister of Health whether arising out of the recent deputation received by him on the subject he proposed to introduce legislation controlling the advertising in this country of patent medicines.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: My right hon. friend is not at present in a position to make any statement on this subject.

Atmospheric Pollution

Mr. THOMAS WILLIAMS asked the Minister of Health whether, in order to secure a cleaner atmosphere and the consequent improvement in the public health, he would recommend to the notice of other local authorities the action of the city of Manchester, which was now carrying out tests of smokeless fuels in its town hall over a period of 12 months; and what had been the Ministry's own experience of smokeless fuel.—Mr. SHAKESPEARE replied: The tests at Manchester have been only recently commenced. The results of the tests will no doubt in due course be available for other authorities. My right hon. friend is informed by the First Commissioner of Works that smokeless fuel has been found satisfactory for use in open grates, but the cost is at the present time greater than that of ordinary house coal, after allowing for relative efficiency.

Injured Workmen and Supply of Surgical Appliances, &c.

Mr. TINKER asked the Home Secretary if his attention had been drawn to the large number of cases of injured workmen who had to get surgical appliances, artificial legs, arms, &c., to assist them to follow their employment; that there was nothing in the Workmen's Compensation Act to cover the cost; and if he will consider amending it so that all such cases shall be met by payment of the cost incurred.—Captain WALLACE, Under-Secretary Home Office, replied: No recent representations to my Department on this subject can be traced, but if the honourable Member will send me particulars of any cases of workmen being unable to obtain necessary appliances without hardship owing to having to defray the cost, I will look into the matter and consult, if necessary, my right hon. friend, the Minister of Health.

Small-pox and Compulsory Vaccination

Mr. GROVES asked the Minister of Health when vaccination against small-pox became obligatory in this country, and what was the effect.—Sir KINGSLEY WOOD replied: vaccination against small-pox for new-born children first became obligatory in this country in 1853. While it is not easy precisely to assign particular effects to this measure, its immediate practical effect may perhaps be gauged from the fact that whereas in the six years 1847 to 1852 the average annual mortality from small-pox per million living persons was 326, the average figure for the six years 1854 to 1859 was 187.

Herbalists

Sir ERNEST GRAHAM-LITTLE asked the Home Secretary whether he was aware that the Statute 34 and 35 Henry VIII., c.8, making provision whereby persons having a certain knowledge of herbs and roots could be privileged to engage in some branches of medical practice was still in force, and that a body calling itself the College of Botanic Therapy claimed under that charter to be privileged to issue diplomas conferring legal status differing from the status of herbalists who had no such diploma; and what steps he proposed to take in the matter.—Sir KINGSLEY WOOD, Minister of Health, replied: I am aware of the statutory provision referred to. I was not previously aware of the claim said to be made by the College of Botanic Therapy and I do not know on what it is based, but I do not feel called on to take any steps in the matter.

TUESDAY, JULY 16TH

Medical Inspection in Scottish Prisons

Mr. LEONARD asked the Secretary of State for Scotland if he had instructed governors and medical officers of Scottish prisons jointly to inspect every part of the prison establishment and to record the result of this inspection in their respective journals; and, if so, would he given the dates of such inspections in the last 12 months in Barlinnie prison recorded in the journals referred to.—Sir GODFREY COLLINS replied: The Prisons (Scotland) Rules provide that the governor and medical officer of each prison shall jointly inspect every part of the prison establishment in the last month of every quarter and that the results of these inspections shall be recorded by the medical officer in his journal. Owing to the length of time necessary to make a thorough inspection of the whole establishment at Barlinnie Prison, it has not always been practicable for the governor and medical officer to make joint inspections, and steps are being taken in the course of the comprehensive revision of the Prison Rules, which is now in progress, to amend the rules dealing with this matter. The dates of the inspections carried out at Barlinnie Prison in the last 12 months were as follows, viz., governor's inspections, Oct. 1st, 1934, Dec. 24th, 1934, March 29th, 1935, and June 18th, 1935. Medical officer's inspections, recorded in the medical officer's journal: Sept. 28th, 1934, Dec. 21st, 1934, March 29th, 1935, and June 21st, 1935.

Mr. LEONARD asked the Secretary of State for Scotland if he was aware that prisoners in Barlinnie prison, ordered to their cell beds as sick, were forced to parade at the prison surgery the following morning along with the prisoners reporting sick; that influenza patients had had to conform to this practice; and would he take steps to ensure that prisoners ordered to bed as sick would be visited in their cells by the medical officer before being called to parade with the ordinary sick.—Sir GODFREY COLLINS replied: Prisoners in Barlinnie who have been ordered to bed because of ailment are not paraded at the surgery on the following morning except when the ailment is a minor one. If the prisoner complains of feeling unwell he is kept in bed until examined by the medical officer. Where influenza has been diagnosed the prisoner is not paraded at the surgery, but is either admitted to the prison hospital or kept in bed in his cell until the medical officer certifies him as fit to get up. The practice does not seem to call for any alteration.

MEDICAL NEWS

University of Cambridge

On June 25th the following degrees were conferred:—

M.D.—G. G. Penman, G. F. Abercrombie, *E. A. Trim, and A. C. Crooke.

M.B., B.Chir.—John Cann, J. H. Shakespeare, John Collinson, Norton Stevens, and E. C. Sugden.

M.B.—R. D. Roper, N. G. Hulbert, P. H. L. Playfair, Benjamin Holden, and G. O. A. Briggs.

B.Chir.—J. F. Dow, R. E. Rodgers, H. S. Wigfield, *Wilfrid Warren, D. A. Smith, and R. T. Gabb.

*By proxy.

University of London

At recent examinations the following candidates were successful:—

D.P.H.

V. F. Anderson, J. H. Blakelock, Hilda L. Byett, Alan Carling, H. S. Davies, David Erskine, W. G. Evans, Mohomed Farooq, O. M. Francis, H. A. Gilkes, J. V. Hurford, Muriel V. Joscelyne, J. T. R. Lewis, Edyth L. Morris, Vaithianather Nadarajah, N. C. Parfit, L. M. Ram, C. J. Sanderson, Hubert Smith, Thomas Standring, E. W. Taylor, V. T. Vagh, J. D. V. Wijeyaratne, W. W. Wildman, R. A. Wilson, and E. D. B. Wolfe.

William Julius Mickle Fellowship.—This fellowship is awarded to the graduate of the university who has done most to advance medical art or science during the last five years. Application should be made to the principal of the university not later than Oct. 1st.

Rogers Prize.—This essay prize will be offered for award in 1936 and is open to all registered medical practitioners. The subject which has been chosen is the natural history of peptic ulcers and essays should reach the vice-chancellor by April 30th. Further particulars may be had from the academic registrar at the University, South Kensington, London, S.W.

University of Aberdeen

On July 10th the following degrees and diploma were conferred:—

M.D.—*F. W. Gordon, *J. S. Robertson, E. R. Sorley (in absentia).

*With commendation.

M.B., Ch.B.—A. J. Slessor (second-class honours), R. A. Barraclough, R. P. M. Brown, W. J. Cameron, A. B. Christie, Dorothy M. Chrystall, Archibald Crerar, J. F. Croll, A. R. R. Cumming, G. I. Davidson, J. J. R. Duthie, Norman Gill, W. T. Gordon, Margaret M'N. Little, Christopher MacDonald, J. S. Mackay, Helen C. S. MacLean, A. D. Morgan, B. M. Nicol, F. J. A. Norris, C. J. Silver, D. F. Smith, T. A. Smith, J. L. Stephen, D. O. Stevenson, R. M'P. Stewart, J. L. Taylor, J. M. Thomson, A. A. White, and W. J. R. Wyness.

D.P.H.—J. G. H. Davidson.

Royal College of Surgeons of England

A quarterly meeting of the council was held on July 11th with Sir Holburt Waring, the president, in the chair. Sir Cuthbert Wallace was elected president for the ensuing year, and Mr. A. H. Burgess and Sir Charles Gordon-Watson were elected vice-presidents. Mr. W. Sampson Handley was appointed a member of the executive committee of the Imperial Cancer Research Fund. Sir Frank Colyer, was reappointed hon. curator of the odontological collection, and Mr. C. J. S. Thompson, hon. curator of the historical collection. The Hallett prize, given in connexion with the primary fellowship examination, was awarded to John Philip Bentley of King's College, London.

The following professors, lecturers, and demonstrators were appointed for the ensuing year: Hunterian Professors: Mr. A. F. MacCallan, the surgery and pathology of trachomatous conjunctivitis; Mr. F. H. Bentley, wound healing by tissue culture methods; Mr. A. M. Boyd, the peripheral circulation in occlusive and spasmodic diseases of the vessels; Mr. Arthur Bulleid, dental sepsis as a factor affecting medical and surgical procedures; Mr. H. Osmond Clarke, injuries of the carpal bones; Mr. John Gilmour, adolescent deformities of the acetabulum; Mr. G. C. Knight, intestinal strangulation; Mr. G. A. Mason, extirpation of the lung; Mr. Reginald Payne, pyogenic infections of the parotid; Mr. G. F. Rowbotham, a series of tumours of the skull; Mr. E. P. Stibbe, the anatomy and surgery of the subtentorial angle; and Dr. E. W. Twining, a radiographic study of the third ventricle. *Arris and Gale Lecturer:* Dr. John Beattie, temperature regulation. *Erasmus Wilson Lecturers:* Mr. C. E. Shattock and Mr. C. P. G. Wakeley, demonstrations on pathology; and Dr. L. W. Proger, four demonstrations on pathology. *Arnott Demonstrator:* Dr. A. J. Cave, demonstrations on the contents of the museum.

Dr. Arthur Maitland-Jones was elected an examiner for the Special Diploma in Child Health. A diploma of fellowship was granted to E. S. Allin, and a diploma of membership was granted to H. B. Hunt.

Licences and diplomas were granted jointly with the Royal College of Physicians, as follows:—

L.D.S.—R. H. C. Ballauff, E. A. Beach, R. A. Beck, M. R. Blair, E. B. Briault, Harry Caldwell, C. R. Collis, W. G. C. Dickson, D. J. Dymond, W. E. Earle, F. M. Eisenstaedt, N. L. Forrester, D. W. Friendship, P. F. B. Gillett, D. A. Godfrey, D. E. Holdway, Harry Jackson, P. F. James, O. C. Jenkins, K. A. Keith, W. C. J. King, G. C. H. Kramer, W. F. Leuner, E. B. Lloyd, S. R. Luton, A. J. May, W. J. R. C. Morgan, Edgar Nelson, A. G. Richmond, J. F. Russell, J. F. M. Sampson, E. R. L. Shrimpton, E. H. F. Webb, D. J. Wigginton, and T. J. Wood.

D.P.H.—A. A. Cunningham, W. L. Devlin, H. A. Ferguson

W. P. Greenwood, E. T. Jones, Behari Lal, F. J. Murphy, T. H. Parkman, S. C. St. G. C. Parry, and R. W. Tannahill.

D.T.M. & H.—A. G. Biggam, E. M. Clark, H. J. Curran, O. E. Fisher, I. D. Gebbie, L. N. Goel, J. O. Gordon, G. M. Graham, G. T. Hindley, J. H. Hudson, D. C. Lahiri, J. S. McNair, P. D. Mohandirange, Théodora Papafigou, E. G. Wilkins, F. J. Wright, and L. P. Younglao.

D.P.M.—*Karl Biden-Steele, S. R. Bray, A. C. Dalzell,* C. C. Edwards, R. E. Hemphill, Margaret N. Jackson, D. E. Jones, T. B. Jones, W. S. Maclay, Bernard Matheson, and I. A. Senanayeke.

D.L.O.—J. W. Gerrie, Kennedy Hunter, R. V. Rao, and Robert Williamson.

University of St. Andrews

Dr. A. R. Moodie has been appointed lecturer in ophthalmology and clinical ophthalmology. Dr. A. M. MacGillivray, lecturer in clinical ophthalmology in the Medical School, Dundee, and Lieutenant-Colonel T. J. Mitchell, assistant in anatomy in the United College, St. Andrews.

University of Dublin

At recent examinations in the School of Physic, Trinity College, the following candidates were successful :—

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Therapeutics and Pathology.—*E. W. L. Thompson, *J. H. A. Jewell, *J. A. Strong, *J. G. Steinbock, M. C. Wood, Max Levy, Sterling Tomlinson, J. M'C. Caldwell, Stella M. Coen, B. G. Kearon, D. J. H. Douglas, D. S. Toole, E. M'G. Cochrane, H. F. T. MacFetridge, C. H. Blackham, Maureen N. S. Mason, P. J. Mullaney, W. D. Chesney, H. J. Walker, W. E. Counihan, E. G. Fox, and Rebecca M. R. Pike.

Medicine.—B. E. O'Brien, D. P. Burkitt, G. J. Dixon, Murie E. Wallace, Maureen C. E. Gore-Grimes, J. C. Gaffney, H. J. Anderson, H. C. Bourke, Harold Pringle, Emanuel Cowan, A. E. Fannin, J. R. Kellett, N. G. Farrell, William Charney, B. M. O'Sullivan, D. J. Hayes, S. B. Sachs, J. R. M'Elroy, R. L. Oakes, J. C. Roux, J. A. Hamilton, F. J. C. Loughran, F. T. P. Bergin, G. W. M. Elliott, R. H. Pratt, R. A. Bond, P. X. O'Dwyer, and A. F. H. Keatinge.

D. G. Walker and P. St. G. Robinson.

Surgery.—J. N. P. Moore, D. G. Walker, H. J. Anderson, Muriel E. Wallace, Harold Pringle, B. E. O'Brien, G. J. Dixon, J. R. Kellett, D. P. Burkitt, Maureen C. E. Gore-Grimes, H. G. Ellerker, L. W. M'Caughey, Maurice Marmelstein, R. H. Pratt, A. D. Egan, R. H. Simon, J. R. M'Elroy, William Charney, and N. G. Farrell.

Midwifery.—S. J. H. Douglas, G. C. Retz, John M'Quillan, W. S. M'Bride, Benjamin Rogol, D. P. Harris, Neville Jackson, P. L. van Aardt, G. S. Caithness, and Eithne M. O'Connell.

D.P.H.

Part II.—D. B. Bradshaw, G. A. Miller, J. K. Lavery, and T. J. O'Sullivan.

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS

M. J. Eakin, C. F. Marks, Chan Ping In, and H. A. Shawarby.

*Passed on high marks.

National University of Ireland

At recent examinations the following candidates were successful :—

M.D.

J. P. Sheehan.

M.B., B.CH., AND B.A.O.

J. G. Barrett, John Breen, Brendan Buckley, James Burke, Jeremiah Cogan, J. P. Corcoran, R. A. Coughlan, D. C. Lawton, J. N. McCarthy, E. M. Newman, John O'Herlihy, and Thomas O'Neill.

Part I.—Vincent Bennett, P. J. Kelleher, Cornelius McGrath, Samuel Nathan, V. J. O'Sullivan, and William O'Sullivan.

Part II.—Michael Kirwan.

D.P.H.

Part I.—Elizabeth J. H. Philpott (née Harris) and R. G. Cross (with second-class honours); D. F. Burke, T. G. A. Carroll, R. A. Good, M. F. Kelleher, M. J. Kennefick, and J. P. O'Leary.

Mr. Robert Dwyer Joyce, has been appointed to the chair of ophthalmology at University College, Dublin.

Mr. Joyce was born in Dublin in 1875, and received his medical education at the universities of Dublin, Vienna, and Berlin. He qualified M.R.C.S. in 1895, and in 1899 obtained the fellowship of the Royal College of Surgeons in Ireland. He was appointed ophthalmological surgeon to the Richmond Hospital, Dublin, and was later appointed to the same position at the Mater Misericordiæ Hospital, which he still holds. He also acts as examiner in ophthalmology for the Royal College of Surgeons in Ireland. His contributions to medical journals include papers on the topography of the facial nerve in its relation to mastoid operations, and on detachment of the choroid.

Dr. D. J. Coffey, pro-vice-chancellor of the University, and president of University College, Dublin, was reappointed representative of the University on the General Medical Council for a further period of three years.

At recent examinations for the B.D.S. degree, Percy Greinson and N. L. Newman were successful.

Queen's University, Belfast

At recent examinations the following candidates were successful :—

M.D.

F. J. Booth and D. H. Smyth (with gold medals), D. H. Smyth (with commendation), Winifred E. Hadden, J. M. Houston, S. W. T. Lee, D. W. Macartney, D. M. Morrison, R. W. Mussen, J. A. Price, Lilian V. Reilly, J. M. C. Speer, Gerald Townsley, and H. B. C. Wallace.

M.B., B.CH., AND B.A.O.

W. M. Brennen, T. D. Carson, G. A. Craig, C. H. Cullen, J. S. Matthews, and J. G. Pyper (with second-class honours), S. J. Allen, Rosetta C. Barker, J. F. Beck, J. W. Burns, C. F. Campbell, J. T. Carson, T. P. Diamond, Mary R. M. Donnelly, K. I. H. Henry, James Houston, R. A. Johnston, M. C. Kelly, Martha L. Kennedy, H. J. Knox, P. A. Lee, S. E. C. Lyons, K. C. M'Keown, T. A. MacLynn, R. W. M'Namara, J. N. Macartney, H. G. Magill, N. S. Martin, J. L. E. Millen, J. K. Moffett, R. A. Monteith, R. S. Nixon, Charles Reid, J. N. W. Ritchie, J. G. Rountree, C. V. P. Ryall, A. H. Scott, R. H. F. Smith, W. M. Stewart, A. W. Thompson, Anna V. Thompson, and N. J. W. Thompson.

On July 13th, the hon. degree of LL.D. was conferred on Thomas Gillman Moorhead, M.D., regius professor of physic, Trinity College, Dublin ; the hon. degree of D.Sc. on Thomas Carnwath, M.B., senior medical officer, Ministry of Health ; and Major-General William Porter Macarthur, deputy director-general Army Medical Services.

The following degrees were also conferred :—

M.D.—F. J. Booth, H. G. Calwell, Winifred E. Hadden, J. M. Houston, S. W. T. Lee, D. W. Macartney, D. McV. Morrison, R. W. Mussen, J. A. Price, Lilian V. Reilly, D. H. Smyth, J. M. C. Speer, G. Townsley, and H. B. C. Wallace.

University of Sheffield

At a meeting of the university council held on July 12th the resignation of Prof. M. H. Phillips of the chair of obstetrics and gynæcology was received. The following appointments were made :—

Dr. G. L. Roberts, to the chair of dental surgery; Mr. John Chisholm, to the chair of obstetrics and gynæcology ; Dr. W. J. Wellwood Ferguson, hon. lecturer in ophthalmology, in succession to Dr. P. J. Hay, who has resigned ; Dr. J. MacD. Croll, lecturer in bacteriology; and Dr. Edward S. Duthie, demonstrator in pathology.

Dr. Roberts graduated M.B. with second-class honours at the University of Liverpool in 1927, and in the next year he obtained the degree of B.D.S. with first-class honours. He held the position of tutor of clinical dental surgery at the University of Leeds, and was hon. demonstrator to the Leeds Dental Hospital. He returned to Liverpool as demonstrator of clinical dental surgery of its dental school, but later went to Birmingham to take up his present post as tutor of dental clinical subjects at the dental school of Birmingham University.

Mr. Chisholm was born in Inverness in 1883, and was educated at Inverness Royal Academy and Edinburgh University, where he graduated M.B. in 1905. After holding resident appointments at St. Mary's Hospital, Manchester, and the Jessop Hospital for Women, Sheffield, he joined the honorary staff of the Jessop Hospital as assistant surgeon and surgeon in charge of the venereal diseases clinic, and is now a member of the senior staff. He is hon. consulting gynæcological surgeon to the Royal Hospital, Sheffield, and lecturer in obstetrics and gynæcology in the University. During the war he held the rank of captain in the R.A.M.C. He became a fellow of the Royal College of Surgeons of Edinburgh in 1920.

Mr. H. C. Malleson, of Guy's Hospital, was appointed an external examiner for the Ph.D. degree.

University of Durham

Dr. E. Farquhar Murray has been appointed professor of midwifery and gynæcology in succession to Prof. R. P. Ranken Lyle.

Dr. Murray is a son of the late Mr. Robert Murray, of Dundee, and a brother of the late Prof. Leith Murray. He received his medical education at St. Andrews, St. Bartholomew's Hospital, Paris, Dublin, and Munich. He qualified M.B. with honours at St. Andrews in 1908 and M.D. in 1911, afterwards going to London, where he held resident appointments at the Chelsea Hospital for Women and Queen Charlotte's Hospital. At the outbreak of war he joined the R.N.V.R. and served as a surgeon-lieutenant, being mentioned in dispatches for distinguished services. In 1918 he obtained the fellowship of the Royal College of Surgeons of England, and after demobilisation was appointed to the staff of the Newcastle Maternity Hospital as assistant. In 1920 he joined the staff of the Royal Victoria Infirmary where he later became hon. gynæcologist, and in the same year he was appointed lecturer in midwifery and gynæcology at the University of Durham College of Medicine. He is a foundation member and fellow of the British College of Obstetrics and Gynæcology and has published papers on radium in treatment of cancer of cervix and menorrhagia, puerperal sepsis, and investigations of tubal abnormalities.

Dr. W. Fletcher Shaw, professor of clinical obstetrics nd gynæcology in the Victoria University of Manchester, as been elected an honorary fellow of the American ynæcological Society.

Velsh National School of Medicine

Dr. L. H. Howells has been appointed demonstrator n the department of materia medica and pharmacology, nd Dr. J. D. Spillane, junior assistant in the medical unit.

Egyptian University, Cairo

Dr. F. H. Smirk has been appointed to the chair of pharmacology in the University. Dr. Smirk, who graduated at Manchester in 1925, at present holds a Beit memorial fellowship and is assistant to the pharmacological department of University College Hospital.

St. Mary's Hospital Medical School

The annual dinner of past and present students of this school will be held at Claridge's Restaurant on Saturday, Sept. 28th, at 7.30 P.M. Mr. Duncan C. L. Fitzwilliam will be in the chair. The hon. secretary is Dr. A. Hope Gosse.

The post-graduate course, which is open to all medical practitioners without fee, will take place on Sept. 27th, 28th, and 29th.

Society for Relief of Widows and Orphans of Medical Men

The quarterly meeting of the directors of this Society was held on July 3rd with Dr. R. A. Young in the chair. One new member was elected and the deaths of three members including Dr. W. Culver James, senior vice-president of the Society were reported. Dr. James was elected a member in 1882 and always took a great interest in the work of the Society. The sum of £2258 was voted for the payment of the half-yearly grants to the 54 widows and 11 orphans in receipt of relief. Three widows of deceased members applied for relief; one who was 71 years of age was voted a yearly grant of £75 and the other two, a yearly grant of £60. Relief is granted only to the necessitous widows and orphans of deceased members. Membership of the Society is open to registered medical men, who at the time of their election are resident within a 20-mile radius of Charing Cross. Full particulars may be obtained from the secretary 11, Chandos Street, London, W.1.

British College of Obstetricians and Gynæcologists

At the quarterly meeting of the council held on July 13th Sir Ewen Maclean was elected president. Dr. H. Russell Andrews and Dr. Bethel Solomons were elected vice-presidents; Mr. Eardley Holland was re-elected hon. treasurer; Sir Gomyns Berkeley hon. appeal treasurer; Prof. Fletcher Shaw hon. secretary; Mr. Frederick Roques hon. librarian.

The following were elected to the membership:—

H. G. E. Arthure (London), Narendranath Basu (Calcutta), J. R. S. G. Beard (Adelaide), Bernard Berger (Bloemfontein), James Black (Johannesburg), Margaret G. Bott (Nottingham), Joyn H. Boyd (New York), R. B. Charlton (Brisbane), G. A. Cook (Melbourne), W. G. Cosbie (Toronto), A. J. Cunningham (New South Wales), Constance E. D'Arcy (Sydney), G. A. Davies (Sheffield), L. L. Davey (Adelaide), H. D. De Sa (Bombay), K. C. Donovan (Sydney), M. H. Elliot-Smith (Brisbane), Tom Farranbridge (Sydney), H. M. Fisher (Toorak), G. P. Fitzgerald (Dunedin), M. B. Frazer and R. I. Furber (Sydney), F. J. Hayden, W. I. Hayes and A. M. Hill (Melbourne), A. F. Hobson (Sydney), J. S. Hovell (Khartoum), T. D. Hughes (Sydney), H. S. Jacobs (Melbourne), J. Jhirad (Bombay), J. L. Jona (Melbourne), Alice M. Kenny (London), H. M. Lazarus (Madras), D. M. Low (Toronto), G. B. Lowe (New South Wales), H. I. McClure (Belfast), R. E. Magarey (Adelaide), B. T. Mayes (Brisbane), A. A. Moon and E. L. Newman (Sydney), L. B. Patrick (Sheffield), Hemendranarayan Ray (Calcutta), T. G. Robinson (Epsom), W. D. Saltau (Melbourne), Ida B. Saunders (Sydney), J. A. H. Sherwin (Melbourne), George Simpson (Victoria), T. H. Small (New South Wales), G. R. Sparrow (Toronto), G. R. Stoneham (New Zealand), Jane B. Stubbs (Manchester), W. E. C. Thomas (Ashton-under-Lyne), R. S. Townsend (Lucknow), H. B. Van Wyck (Toronto), Ramsay Warden (Melbourne), James Waterman (Port of Spain), Keith Vartan (London), and H. B. Williams (Sydney).

The following were admitted by the president:—

Fellows.—*L. C. Conn (Edmonton, Alberta), Amy M. Fleming and V. J. F. Lack (London), *W. C. Spackman (Bombay), and Leslie Williams (London).

Members.—M. D. Black (Glasgow), *Ebenezer Maduram (Madras), and Joyce Morgan (London).

* In absentia.

University of Manchester

Messrs. Boots Pure Drug Company, Limited, have made a grant of £300 per annum for three years for the provision of scholarships or technical assistance in the department of clinical investigations and research.

The following appointments are announced: Dr. Norman Kletz, lecturer in clinical medicine; Dr. William Brockbank, lecturer in medicine for dental surgery; Dr. D. H. Mackay and Dr. E. L. Patterson, demonstrators in anatomy; Dr. C. S. D. Don, demonstrator in systematic medicine; and Dr. Walter Schlapp, tutor and secretary to the faculty of medicine.

Leverhulme Research Fellowships

Leverhulme research fellowships have been awarded to Dr. D. B. Blacklock, professor of tropical medicine in the University of Liverpool; Dr. M. G. Blacklock, curator of the museum, Liverpool School of Tropical Medicine.

A grant in aid of research has been made to Dr. J. W. W. Stephens, F.R.S., emeritus professor of tropical medicine in the University of Liverpool. Application forms and further information may be obtained from the secretary, Leverhulme Research Fellowships, Union House, St. Martins-le-Grand, London, E.C.1.

The International Congress on Life Assurance Medicine

This congress meets in London next week, under the presidency of Sir Walter Langdon-Brown, at the offices of the Prudential Assurance Company, Holborn Bars, E.C. The meetings begin on Tuesday, and particulars may be had from the hon. secretary, Dr. Otto May.

In connexion with the congress an exhibition dealing with health service and life assurance, organised by Dr. Neustatter, of Berlin, is being held at the Prudential offices. Any medical men interested in the subject will be welcome on Tuesday, July 23rd, from 10 A.M. to 5 P.M., upon presentation of their visiting card.

London Hospital

Presenting his twenty-fifth annual report as dean of the medical college on July 11th, Prof. William Wright spoke of the additions of the last quarter of a century, including a dental school a clinical theatre, a cardiac institute, a residents' hostel, and a students' hostel. Seven new separate departments had been created, and six professorial chairs; funds of upwards of £100,000 had been accumulated for the advancement of medical research; ten members of the staff had been elected fellows of the Royal Society; while 1800 students had obtained a first medical qualification, and 300 a second or higher qualification such as F.R.C.S. or M.R.C.P. In reviewing the year, Prof. Wright mentioned the appointment of Dr. A. Burrows as assistant physician in the skin department, and Dr. J. R. Marrack to the new chair in chemical pathology. The various departments of clinical pathology have been combined under the directorship of Dr. P. N. Panton, and a neurological department has been established under Dr. George Riddoch and Dr. W. Russell Brain. Dr. J. Davidson and Dr. N. M. Goodman have been appointed lecturers in forensic medicine and public health respectively, while Dr. S. P. Meadows, Mr. H. E. Harding, and Mr. H. S. Morton have joined the staff as first assistants in the neurological, surgical, and obstetric departments. Dr. A. E. Clark-Kennedy has accepted the newly constituted office of sub-dean. The students' hostel, Prof. Wright reported, has admirably fulfilled its purpose, but unfortunately still carries a debt of £15,000. As for the entry of students, it was higher last year than at any time since 1918–19.

Presenting the prizes to the students, Mr. John Masefield, O.M., the Poet Laureate, expressed his distaste for the phrase "a healthy mind in a healthy body." "We have gone far beyond such things in these days," he said. "I feel that what both the writers and the men of science want is to have a delightful and a delighted mind in a delighted and delightful body." This goal would be brought nearer, he felt, if the direction of affairs were entrusted more to scientists and less to the haphazard demagogue. Sir William Goschen proposed a vote of thanks to Mr. Masefield, and this was seconded by Mr. Eardley Holland.

University of Oxford

It is announced that Lord Nuffield's gift for the equipment of the new institute of medical research (described in our issue of May 25th) will be £16,000. As already stated, Lord Nuffield has also made the Radcliffe Observatory building, and surrounding land, available for medical research.

General Board of Control for Scotland

Dr. Kate Fraser has been appointed commissioner of the General Board of Control for Scotland in place of Dr. H. C. Marr, who is retiring. Dr. Fraser holds at present the position of departmental commissioner under the Board.

Naval Medical Compassionate Fund

At the quarterly meeting of the directors of this fund, held on July 12th, with Surgeon Vice-Admiral R. W. B. Hall, medical director-general of the Navy, in the chair, the sum of £70 was distributed to applicants.

Medical Society of Individual Psychology

At the annual general meeting of this society on July 11th the following were elected officers and members of committee for next session: chairman, Dr. M. Bevan-Brown; vice-chairman, Sir Walter Langdon-Brown; treasurer, Dr. H. C. Squires; editor (if available), Dr. J. C. Young; secretary, Dr. Alexander Baldie; members of committee, Dr. Beattie, Dr. Taylor, Dr. Joyce Partridge, and Dr. Woodcock.

Imperial Social Hygiene Congress

The dinner given by the British Social Hygiene Council at the May Fair Hotel on July 11th celebrated the success of the seventh Imperial Social Hygiene Congress (reported on another page). Proposing the toast of Health and Education in the Empire, Prof. Winifred Cullis spoke particularly of the council's efforts to spread the teaching of biology and to apply it to the problems of life. The teaching of science would not make people perfect; biologists were not perfect themselves. But Prof. Cullis believed that it was a basis on which a better and fuller life could be built—provided always there was a conscience, and spiritual values, in the background. Replying to the toast, Dr. Arthur MacNalty, chief medical officer of the Ministry of Health and the Board of Education, referred to the international and imperial implications of public health work and of the Ministry's keen coöperation with the League of Nations Health Organisation in combating disease throughout the world. He paid a tribute to Mrs. Neville-Rolfe, secretary-general of the council, for her undiscouragable spirit in forwarding the work. Sir Francis Fremantle briefly proposed the Guests, guiding his hearers skilfully through posses of distinguished representatives of ministries and public health services. Sir Bede Clifford, governor of the Bahamas, in responding, regretted that half the Empire should not know where the other half was, and welcomed the Imperial Congress as a means of exchanging information and ideas. The Colonial Empire, he said, would hardly exist to-day but for the labours of medical men like Sir Patrick Manson, and their successors were doing invaluable work and making observations which ought to be better known. As an example of a small but possibly useful fact he mentioned that it had recently been noticed in the Bahamas that pellagra increased in years when hurricanes had destroyed the citrus fruits. In conclusion, Sir Bede referred to some of the problems of quarantine arising in an island situated only 200 miles from the American coast and linked with it by daily air services. Miss Florence Horsbrugh, M.P., also spoke of the value of the congress in informing public opinion. As a representative of Great Britain at Geneva she had learnt the necessity of the public understanding something of the problems that mattered most to mankind. There was far more talk about road accidents, for instance, than about health or housing. Replying to his health, proposed by Lieut.-Colonel Sandeman Allen, M.P., Sir Basil Blackett, the president, said that the council spread its net wide and was much in earnest. He recommended Government departments to do whatever Mrs. Neville-Rolfe told them.

Caledonian Medical Society

The annual dinner of this society was held at Bamburgh on June 28th under the presidency of Dr. James McDonald, of Belford, Northumberland.

Royal Hospital for Incurables, Putney

The Duchess of York will visit this institution on July 24th to open a new nurses' home which has been erected at a cost of £25,000. She will receive purses towards meeting this extra expenditure.

Warde-Aldham Hospital, South Elmsall

Lord Moynihan has opened a new X ray department and massage and theatre block at this hospital, which exists chiefly for the benefit of miners.

Western General Hospital, Edinburgh

Preliminary plans for the modernisation of this institution—one of the chain now run by the city—at an estimated cost of £120,000 are being considered. The nurses at present live in a block in the hospital, but it is proposed to build a new home a short distance away where they can live in pleasant surroundings.

Appointments

BENN, E. C., M.B. Liverp., has been appointed Medical Superintendent of the Leeds City Hospitals, Seacroft.

BOLAND, E. R., F.R.C.P. Lond., D.P.H., Assistant Physician to the Hospital of St. John and St. Elizabeth, London.

DOUGLAS, J. B., M.B. St. And., D.M.R.E., Radiologist to the Bethlem Royal Hospital, London.

GILPIN, ARCHIBALD, M.D., M.R.C.P. Lond., Assistant Physician to King College Hospital.

HAWKSLEY, J. C., M.D., M.R.C.P. Lond., Hon. Assistant Physician to University College Hospital.

HAYES, E. D. T., M.D. Dub., D.P.M., medical superintendent at the Northampton County Mental Hospital.

HERON, J. P., M.B., F.R.C.S. Edin., Resident Medical and Surgical Officer and Registrar at the Royal Albert Edward Infirmary, Wigan.

HOYLE, J. CLIFFORD, M.D., M.R.C.P. Lond., Assistant Physician to the Hospital for Consumption, Brompton.

JOHNSON, WILLIAM, M.D., F.R.C.P. Lond., Hon. Physician to the Royal Liverpool Children's Hospital.

MUSHIN, WOOLF, M.B. Lond., Hon. Assistant Anæsthetist at the Central London Throat, Nose, and Ear Hospital.

PEEL, J. H., B.M. Oxon., F.R.C.S. Eng., M.C.O.G., Registrar to the Samaritan Free Hospital for Women, London.

PLAYFAIR, PATRICK, M.B. Camb., F.R.C.S. Eng., Registrar at Queen Charlotte's Maternity Hospital, London.

PLUMMER, N. S., M.D., M.R.C.P. Lond., Assistant Physician to the Charing Cross Hospital.

RICH, W. M., L.R.C.P. Lond., Resident Medical Officer at the Keighley and District Victoria Hospital.

TAYLOR, A. B., M.D. Birm., M.R.C.P. Lond., First Assistant Medical Officer at the King Edward VII. Sanatorium, Midhurst.

THOMAS, E. W. P., M.B. Camb., Hon. Registrar to the Skin Department at St. Thomas's Hospital.

TROUP, JAMES, M.B. Manch., F.R.C.S. Edin., Hon. Surgeon in Ordinary to the Royal Hampshire County Hospital, Winchester.

Medical Referee under the Workmen's Compensation Act, 1925: For the Bury, Rochdale, Oldham, Salford (Circuit No. 5), and Manchester (Circuit No. 8) County Court Districts. Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W.1, before August 3rd.

Vacancies

For further information refer to the advertisement columns

Borough.—M.O.H. £800.

cond H.S. At rate of £150.

atorium.—H.P. At rate of £75.

tal.—Res. Surg. O. £175. Also

Each at rate of £75.

Committee.—Asst. School M.O.

£500.

Birmingham, Dudley-road Hospital.—Jun. M.O. At rate of £200.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Sen. Asst. M.O. £750.

Birmingham, West Heath Sanatorium.—Res. Asst. M.O. At rate of £250.

Birmingham and Midland Eye Hospital.—H.S. At rate of £130.

Bolton R £125.

Bradford At rate of £135.

Brighton, *Women's Hospital.*—Res. H.S. £130.

Buxton, Devonshire Hospital. H.P. Also Asst. H.P. At rate of £200 and £150 respectively.

Cambridgeshire County Council.—Asst. County M.O. £500.

ury, Kent and Canterbury Hospital.—2 H.S.'s. Each at te of £125.

, King Edward VII. Welsh National Memorial Associa- n.—Asst. Res. M.O. for South Wales Sanatorium. £200.

, East Lancashire Tuberculosis Colony, Barrowmore Hall.— .P. At rate of £150.

f London Hospital for Diseases of the Heart and Lungs, ictoria Park, E.—H.P. At rate of £100.

hire Hospital for Sick Children.—Res. H.S. At rate of 130.

ster Royal Infirmary.—H.S. to Eye and Ear, Nose, and hroat Depts. £175.

nought Hospital, Greenwich, S.E.—H.S. At rate of £110.

, King Edward Memorial Hospital.—Jun. Res. M.O. t rate of £150.

urne, Princess Alice Hospital.—Res. H.S. £150.

a Hospital for Sick Children, Southwark, S.E.—H.S. At ate of £120.

al Lying-in Hospital, York Road, Lambeth, S.E.—Jun. Res. M.O. and Anæsthetist. At rate of £100.

n-square Throat, Nose and Ear Hospital, Nr. Piccadilly- ircus.—Anæsthetist. £150.

sby and District Hospital.—Sen. and Junr. H.S. £200 nd £150 respectively.

ogate Royal Bath Hospital.—Res. M.O. £156.

, Middleton-in-Wharfedale Sanatorium.—Sen. Asst. M.O. 450.

ich, East Suffolk and Ipswich Hospital.—H.P. and H.S. Each £120.

y General Hospital and Poor Law Infirmary.—Asst. Res. M.O. At rate of £150.

ston-upon-Hull, Beverley-road Institution.—Two Asst. M.O.'s. Each £350.

aster Royal Infirmary.—Jun. H.S. At rate of £130.

Infirmary, Lancs.—Sen. Res. H.S. Also Jun. H.S. At rate of £175 and £150 respectively.

rpool, Bootle General Hospital.—H.P. Two H.S.'s. Also Cas. O. Each at rate of £150.

rpool, Broadgreen Sanatorium.—Res. Asst. M.O. £200.

lon Homœopathic Hospital, Great Ormond-street, W.C.— Gynæcological H.S. At rate of £100.

clesfield General Infirmary.—Second H.S. At rate of £150.

chester, Ancoats Hospital.—H.S. At rate of £100. Also Orthopædic H.S. At rate of £100.

chester, Christie Hospital and Holt Radium Institute, Withington.—Asst. Radium Reg. £400.

chester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

chester Northern Hospital, Chatham Hill-road.—Hon. athologist. £100. Also Bio-Chemist for Pathological Dept. £120.

chester and Salford Hospital for Skin Diseases.—H.S. At rate of £150.

ropolitan Hospital, Kingsland-road, E.—Res. Cas. O. £100.

dlesbrough, North Riding Infirmary.—Third H.S. and Cas. O. At rate of £125 and £150 respectively.

ler General Hospital, Greenwich-road, S.E.—Anæsthetist. 52 guineas.

castle, Throat, Nose and Ear Hospital, Rye Hill.—H.S. £100.

thampton County Mental Hospital, Berrywood.—Deputy Med. Supt. £550.

wich, Jenny Lind Hospital for Children.—Res. M.O. £120.

tingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £150.

estry, Robert Jones and Agnes Hunt Orthopædic Hospital.— H.S. At rate of £200.

tsmouth City.—Tuber. O. and Sen. Asst. M.O.H. £750. Also Asst. M.O.H. and First Res. Med. Asst. £600–£750. Also Asst. M.O.H. and Second Res. Med. Asst. £500–£700.

incess Beatrice Hospital, Earl's Court, S.W.—Hon. Clin. Asst.

tney Hospital, Lower Common, S.W.—Res. M. and Cas. O. At rate of £100.

een's Hospital for Children, Hackney-road, E.—H.S. and Cas. O. Each at rate of £100. Also Sen. Res. M.O. At rate of £200.

ading, Royal Berkshire Hospital.—Cas. O. Also H.S. Each at rate of £125.

chdale Infirmary and Dispensary.—Jun. H.S. £200.

mford, Essex, Oldchurch Hospital.—Pathologist and Asst. M.O. £600.

yal National Orthopædic Hospital, 234, Great Portland-street, W.—Two H.S.'s. for Country Branch. Each at rate of £150.

yal Naval Medical Service.—Nine M.O.'s.

yal Northern Hospital, Holloway, N.—Two Clin. Assts.

Thomas's Hospital.—M.O. in charge of Physio-Therapeutic Dept.

effield, Children's Hospital.—H.S. At rate of £100.

effield Royal Hospital.—Two Res. Asst. Cas. O.'s. Also Res. Anæsthetist and Holiday Locum. Each at rate of £80.

effield, Royal Infirmary.—Ophth. H.S. At rate of £120. Also H.S. and H.P. Each at rate of £80.

ockport Infirmary. Hon. Ophth. Surgeon.

oke-on-Trent, Longton Hospital.—H.S. £160.

wansea General and Eye Hospital.—Cas. O. At rate of £150 to £175.

est Bromwich, Hallam Hospital.—Res. H.P. At rate of £200.

estminster Hospital, Broad Sanctuary, S.W.—Wander Scholar (Clin. Path. and Reg. to Children's Dept.). £250.

igan, Royal Albert Edward Infirmary and Dispensary.—H.S. At rate of £150.

illesden General Hospital, Harlesden-road, N.W.—Res. Cas. O. At rate of £100.

olverhampton Royal Hospital.—H.S. for Fracture and Orthopædic Dept. At rate of £100.

orcester R [illegible] so Jun. H.S. At rate of £160 ar [illegible]

orksop, F [illegible] At rate of £150.

Births, Marriages, and Deaths

BIRTHS

Broadbent.—On July 6th, at Queen's-gardens, W., the wife of Hubert Broadbent, M.R.C.S., of a daughter.

Evans.—On July 7th, at Edmonton, London, the wife of P. F. Evans, M.R.C.S., of a son.

Graves.—On July 8th, at Devonshire-street, W, the wife of Dr. T. C. Graves, of Birmingham, of a daughter.

Greaves.—On July 13th, at Dumfries, the wife of Surg.-Lt. W. Greaves, R.N., of twins (son and daughter).

Mackintosh.—On July 9th, the wife of Dr. Ian Mackintosh, Whitwell, Hitchin, of a son.

McBrien.—On July 4th, at Maidstone, Kent, the wife of L. P. McBrien, M.R.C.S., of twins (son and daughter).

Potts.—On July 6th, at Salisbury, the wife of J. L. Potts, B.Chir., of a daughter.

Williams.—On July 5th, at Sutton, Surrey, the wife of L. G. Williams, M.R.C.S., of a son.

Wraith.—On July 15th, 1935, to Jessie Evelyne Sheret, M.B., B.S., D.M.R.E., wife of F. Wraith, M.B., Ch.B., Foots Cray, Lymm, Cheshire—a son.

MARRIAGES

Bedford—North.—On July 13th, Davis Evan Bedford, F.R.C.P., to Audrey Selina North, eldest daughter of Mr. and Mrs. Milton Ely, of Sutton, Surrey.

Chappel—Hovey-Rhodes.—On July 6th, at Bowdon Downs Church, H. M. Chappel, B.Chir., to Margaret Sylvia Hovey-Rhodes.

Connell—Stannus.—On July 6th, at Windsor, Arthur Blackall Connell, M.D., to Edris Stannus (Ninette de Valois).

Craig—MacLeay.—On June 29th, at Singapore, Major Walter James Fairlie Craig, R.A.M.C., to Anita Esther Lloyd MacLeay.

Magnus—Aiken.—On July 13th, at St. Andrew's Church, Hampstead, Dr. H. A. Magnus, of St. Bartholomew's Hospital, London, to Kathleen Aiken, of Belfast, North Ireland.

Smith—Jennings.—On July 4th, at Rydal Church, Charles Edwin Smith, M.R.C.S., Ambleside, to Violet Jennings.

DEATHS

Bird.—On June 22nd, at Quetta, from earthquake injuries, Major Joseph Godfrey Bird, I.M.S., aged 45 years.

Campbell.—On July 4th, Henry Johnstone Campbell, F.R.C.P., J.P., of Dartmouth, formerly of Bradford, Yorks, aged 76.

Craig.—On July 3rd, at Kirkcudbright, Surg. Capt. John W. Craig, R.N. (ret.), aged 63.

Crawford.—On July 1st, at Edinburgh, John Crawford, M.D., Tayvallich, Argyll, late M.O.H. of County of Zetland.

Day.—On July 12th, at Colchester, William Leigh Maule Day, M.D., in his 59th year.

Field.—On July 3rd, at North Wallington, Surrey, George Hammond Field, M.B.

Grace.—On July 5th, Nathaniel Grace, M.D., of Tunbridge Wells, aged 65.

Heathcote.—On July 6th, Henry Charles Heathcote, M.B., Bath, aged 64.

Hughes.—On July 7th, after long illness, at Sydney, Samuel Henry Hughes, F.R.C.S., aged 71.

Manders.—On July 5th, at Chesham Bois, Lieut.-Colonel Horace Manders, F.R.C.S., in his 83rd year.

Myles.—On July 14th, at Folkestone, Edmond Henry Myles, Major R.A.M.C. (ret.), in his 79th year.

Peachey.—On July 7th, at Barnes, George C. Peachey, L.R.C.P.

Ralston.—On June 24th, in Johannesburg, Robert Gow Ralston, F.R.C.S., aged 62.

Reynolds.—On July 2nd, at High Wycombe, Lewis William Reynolds, M.R.C.S., J.P., aged 79.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, July 22nd, to Saturday, July 27th.—Blackfriars Skin Hospital, Blackfriars-road, S.E., afternoon course in dermatology. All Saints' Hospital, Austral-street, S.E., course in urology.—Courses and clinics arranged by the Fellowship are open only to members and associates.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.

Thursday, July 25th.—3 P.M., Dr. Blake Pritchard: Clinical Demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

Thursday, July 25th.—2 P.M., Dr. D. Bateman: Methods of Testing for Asthma. 3 P.M., Dr. A. Signy: Pathological Demonstration.

Out-Patient Clinics daily at 10 A.M. and ward visits (except Wednesday) at 2 P.M.

INTERNATIONAL CONGRESS ON LIFE ASSURANCE MEDICINE.

Wednesday, July 24th to July 26th.—Congress at the offices of The Prudential Assurance Company (142, Holborn-bars, E.C.).

NOTES, COMMENTS, AND ABSTRACTS

DIMENSIONS OF SICK WARDS

THE dimensions of sick wards to be erected in the future at general hospitals under the management of the L.C.C. are being standardised. In submitting proposals to this end to the Council, the general purposes committee state that experience has proved that the comfort and well-being of the patient, and his efficient treatment, should be the determining factors in deciding the dimensions of a ward, and that if these be adequately provided for all other considerations and all theoretical formulæ can be disregarded The proposals made relate solely to the normal type of ward in which the beds are placed at right angles to the side walls. The experience of wards in which the beds are parallel to the side walls is not sufficient to warrant the laying down of standards.

The dimensions recommended are as follows:—

> That the standard width for all types of wards to be erected in the future at general hospitals be 26 feet and that the other dimensions of the wards be as follows: (i) *acute wards*, including maternity, tuberculosis, venereal diseases, and acute mental wards—wall space per bed, 8 feet; height, 11 feet up to a length of 50 feet and 12 feet when the length exceeds 50 feet; (ii) *chronic wards*—wall space per bed, normally 7 feet, but when offensive cases are treated in the ward, 8 feet; height, as for acute wards; (iii) *cot wards*—wall space per bed, 7 feet; height, as for acute wards; (iv) *single-bedded wards*—to be not less than 11 feet by 10 feet and the height to be 10 feet or in conformity with the general plan.

Subject to certain reservations, these standards will be applied to existing wards as soon as the position with regard to accommodation makes it practicable. The proposals for the acute wards give a floor space of 104 square feet for each patient, and a cubic capacity of 1144 cubic feet per patient. This cubic capacity is less than was formerly considered desirable because in the past great importance was attached to height of wards as providing additional air space, and lofty wards up to 16 feet in height were the rule, generally with quite inadequate window space. It is now known that any increase in the height above 12 feet does little or nothing to improve the condition of the air, and that satisfactory ventilation depends on adequate window space and its proper use. It is, therefore, considered possible to reduce the height of wards as compared with the old standards without detriment to their condition or appearance, and with considerable saving in building costs. No ruling for length of ward is laid down, but the committee state that it is improbable that unbroken wards as long as 100 feet will ever again be constructed.

BIG-GAME PHOTOGRAPHY

IT is refreshing sometimes to be transported from a common-place world to one where not only success in enterprise but actual survival depends on exceptional physical fitness and a reaction time quicker than the normal. Mr. Cherry Kearton[1] has had exciting adventures with animals and men to which his fascinating photographs bear witness, and has many tales to tell. One of his objects in describing and picturing his adventures is to encourage the big-game hunter of the future to substitute the camera for the rifle, and to this end a less constant insistence on the perils of the jungle and coast would have been more effective. Those who read of the frequent occasions on which Mr. Kearton narrowly escaped falling from the top of a cliff on to sea-washed rocks or avoided savage attack from his camera subjects may find it difficult to understand why he should rate the preservation of his life so much lower than the preservation of his negatives. They may even decide, realising the extent to which the photographer must needs rely upon his good fortune, that they will not risk emulating his experiences without providing themselves with a serviceable rifle. But with all endeavour to preserve animal types we have deep sympathy; the safety of society demands their removal in many places, but biological research would certainly suffer from their extermination.

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[1] Adventures with Animals and Men. London: Longmans, Green and Co., Ltd. 1935. Pp. 292. 12*s.* 6*d.*

SOME METHODS OF HEALTH EDUCATION[1]

A LITTLE book intended for school-teachers should prove useful to all those who are concerned with health propaganda. Its object is not to teach hygiene but to suggest how to inculcate good habits, instil knowledge, and promote a right attitude to personal and communal problems of health. The titles of the four chapters indicate the line of approach: The Aims and Values of Health Education, the Content of the Health Education Course, School Methods and the Gaining of Health Knowledge, and Teaching Aids in Health Education. There are 27 illustrations giving point to the text. If it can be assumed that teachers have themselves the right kind of knowledge, it would be difficult to find a better presentation of the way in which it should be applied. Where the authors refer to points in hygiene they are nearly always accurate. The book can be commended to education authorities and bodies responsible for the training of such officers as health visitors.

WOMEN OVER FORTY

A SIMPLE, friendly book has been written by an American author[2] for women who have reached the traditionally dispiriting age of 40, after which, they are urged to believe, they may embark on the "golden years" of their lives. The book contains nothing that is new or informative for the medical reader; but it may well prove serviceable for recommendation to women patients who evince the psychological and physical difficulties of the menopause in a pronounced form.

THE "ALBATROSS"[3]

THIS pious biography by a grandson introduces us to the interesting personality of a Newfoundland doctor, still living, who has carried on a large practice for many years mainly by visits across the sea in his own yacht, the "Albatross." It is an interesting little story of personal courage, energy and resource, and we agree with Mr. Fitz-Gerald that when the hero of the book dies he will leave behind him a long record of service to his fellow-men.

SUN-BATHING

APPROPRIATE to the season is a little brochure[4] by Mr. I. O. Evans on sun-bathing, both "ordinary" and what the author is pleased to call "complete." It deals with practical and psychological problems of nudism, and gives a bibliography, a list of sun-bathing organisations, and of the seaside resorts which permit men to bathe in slips or trunks.

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[1] Some Methods of Health Education. By M. B. Davies, Lecturer in Hygiene at the North Wales Training College, Bangor; and L. Wilkes, M.A., Lecturer in Education at the North Wales Training College, Bangor. London: Longmans, Green and Co., Ltd. 1935. Pp. 111. 2*s.* 6*d.*

[2] Women Over Forty. By Sarah Trent. London: G. Duckworth and Co., Ltd. 1935. Pp. 208. 3*s.* 6*d.*

[3] The "Albatross": being the Biography of Conrad Fitz-Gerald, M.R.C.S., L.S.A., 1847–1933. Written by Conrad Trelawney Fitz-Gerald, Junr. Bristol: J. W. Arrowsmith Ltd. Pp. 208. 8*s.*

[4] Sensible Sun-Bathing. By I. O. Evans. London: Werner Laurie Ltd. 1935. Pp. 48. 1*s.*

ROYAL EYE HOSPITAL, SOUTHWARK.—*The attendances* at the out-patient department of this hospital during the last year have much increased, and the rebuilding schemes are to be carried out as quickly possible.

ADDRESSES AND ORIGINAL ARTICLES

INFECTION AND ITS CONTROL IN CHILDREN'S WARDS *

BY E. H. R. HARRIES, M.D. Lond.

MEDICAL SUPERINTENDENT, NORTH-EASTERN HOSPITAL
(LONDON COUNTY COUNCIL)

LECTURE I

THE problems of ward infection in their various aspects have within the last few months been debated both in the medical press,[1] and at meetings of medical societies.[2] Cross-infection is the bane of the staffs of both children's and fever hospitals, which are, to all intents and purposes, children's hospitals with a limited clinical field. At one time this clinical field was much more limited that is the case now that the large fever hospitals admit every variety of zymotic disease whether notifiable under the Infectious Diseases Notification Acts or not. The practical effect of this extension of the clinical field, from the medical and administrative points of view, has been the admission of large numbers of children of the younger age-groups suffering from such diseases as epidemic diarrhœa, whooping-cough, and measles.

Upon the consequences of extraneous infection it is unnecessary to dwell. They may be perilous to the individual child ; they are always, in some degree, detrimental to the hospital. Long detention, especially if the cause be some superimposed infective process, may result in that complex of physical and psychical deterioration known as hospitalism. From the administrative standpoint, if wards are encumbered by long-stay patients or closed to new ones, the machinery of admission and discharge breaks down. The overhead charges remaining undiminished, the average cost of the patients treated rises. Equally important, the reputation of the individual institution or of institutions of its particular type inevitably if insensibly suffers.

Sources of Infection

The sources of infection of any type in children's wards may be classified as those : (1) *External to the hospital :* the household, creches, infant welfare centres, schools, and cinemas. (2) *External to the wards :* waiting rooms, casualty rooms, out-patient departments, or the receiving rooms of fever hospitals. Although obviously infective children are promptly segregated pending final disposal by the medical staff, some must escape notice until the damage is done. (3) *Within the wards :* children inadvertently admitted in the incubation period or prodromal stage of an acute-infective condition ; unrecognised *formes frustes ;* carriers amongst either patients, staff, or visitors.

The extraneous infections which from time to time are so introduced fall into the following categories :—

A. Acute infections of the upper respiratory tract.—(1) Common specific infections, seven in number. Three of these (diphtheria, scarlet fever, and whooping-cough) are bacterial diseases ; four (measles, rubella, mumps, and chicken-pox) are caused by viruses. (2) Non-specific, or rather unspecified infections of bacterial, viral, or combined origin. These unspecified infections may be superimposed upon those of the specific group, and are the chief causes of the major complications of two of them, namely, measles and whooping-cough.

B. Acute infections of the gastro-intestinal tract.—Discarding protozoal and helminthic infections, the intestinal infections fall into two groups : (1) Primary, those caused by the ingestion of organisms of the *B. coli*-paratyphoid-dysentery group, which are thus to a large extent specific infections ; and (2) secondary. These are brought about by the ingestion of organisms derived from primary upper respiratory tract infections. Occasionally the intestinal infection may be primary and the respiratory tract infection secondary.

C. Cutaneous infections.—(1) Pyococcal, such as impetigo contagiosa and paronychia. (2) Parasitic, such as pediculosis, scabies, and the tineas.

D. Genito-urinary infections.—(1) Pyelitis and cystitis. (2) Vulvo-vaginitis : (*a*) venereal, and (*b*) non-venereal.

To a considerable extent the incidence of extraneous ward infections depends upon the type of work carried out in the institution, since this determines the age-groups of the children likely to be admitted and the length of time they remain. Age-grouping has clearly an important bearing upon the type of infection likely to be introduced and the chances of its dissemination among any particular ward population. The average length of stay governs the number of children admitted to the wards and thus the opportunities for the introduction and transference of infection.

If the average stay is short, implying a large number of admissions, it is impossible, as a general measure, to impose, for an adequate length of time, a preliminary period of quarantine or to undertake active immunisation, methods of general and specific prophylaxis which are feasible when the stay is likely to be long and the admissions, as a result, relatively few in number.

On a basis of length of stay hospitals for the treatment of children fall into three groups : (1) *General children's hospitals,* exemplified by the voluntary children's hospitals, which admit patients from the neonatal period up to the age of 12–14 years and retain them for three days or less up to two or three weeks at the longest. Many of these institutions have convalescent branches in the country. (2) *Special hospitals* for children suffering from orthopædic, tuberculous, or rheumatic conditions, and whose stay may extend over many months. (3) *Fever hospitals,* most of whose patients are children brought by ambulance either direct from their homes or from other institutions. The average length of stay exceeds a month.

Children's hospitals all possess isolation accommodation for use in emergency or for special cases, but, in this country, they are ordinarily concerned with the common fevers only as sources of infection to other patients. So far as possible, children suffering from the exanthemata are removed to fever hospitals. From the point of view of students this removal is in many ways unfortunate, since there is a tendency, when certain diseases are treated in special institutions, to regard the diseases themselves as something essentially different, instead of integral parts of general medicine.

Although fever hospitals are no longer seriously regarded as having any appreciable effect upon the incidence of the endemic fevers in the community, yet since every patient at the time of admission is deemed to be a potential source of infection, it is necessary to secure that, so far as possible, infectivity has ceased before discharge from hospital. Thus length of stay in the fever hospital is always determined by two factors : physical fitness and freedom from infection. Depending upon the disease, either of these two states may precede the other by a considerable interval. Unfortunately there is a third factor, extraneous infection of any kind which, however trivial clinically, may, by prolonging infectivity, add very greatly to the average length of stay of patients.

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* The Milroy lectures for 1935, delivered before the Royal College of Physicians of London.

The fever hospital must retain its patients until any potential source of infection whatever has been eliminated.

Within recent years the average length of stay of patients in many fever hospitals has been reduced very considerably, not only without detriment to, but to the great advantage of the patient and without any increase, but a decrease rather, in the return-case rate. Under the conditions obtaining in open wards, it may be said that the longer a child remains in the milieu of infection, the longer is he likely to remain, and the more difficult is it to secure bacteriological righteousness; in a word, he becomes hospitalised.

The chief reduction in the average days' stay has taken place in the case of scarlet fever. The traditional period of detention of six weeks has become for the uncomplicated case a month. This reduction has been brought about primarily by the disregard of desquamation, justified by the work of the Dicks, but also by the mild type of the disease, with a lessened incidence of complications. This incidence has been reduced still further, in the belief of many, by the use of scarlet fever antitoxin. Another factor which has operated to reduce the length of stay of scarlet fever patients has been the segregation and specialised treatment by otologists of patients suffering from middle-ear disease, at one time a most enduring and reputedly most infective complication.

Incidence of Infection in Children's Wards

SPECIFIC

Some recent figures of the incidence of the specific infectious diseases in the wards of the three different types of institution mentioned above may be given (1) During 1933 it is recorded [3] that among 3561 patients admitted to a large provincial children's hospital, there occurred 136 cases of infectious disease or 3·8 per cent. of the admissions. Of these, 79 (58 per cent.) developed in hospital within their respective incubation periods and 41 (30 per cent.) were contracted in the wards. The origin of 16 cases was unknown The two infections most frequently introduced in the incubation period were scarlet fever and measles. Being exceptionally well provided with isolation accommodation this hospital was able to retain over 40 per cent. of the patients who were unsuitable, for one reason or another, for removal. The opinion is expressed by the reporter that the figures would possibly have been worse but for the passive immunisation of contacts and for the existence of the isolation block.[2]

(2) Agassiz [4] reports that during ten years at the High Wood Hospital for tuberculous and rheumatic children of all ages up to fifteen years, amongst 7000 admissions, an average of 700 annually, the incidence of infectious diseases, diphtheria and scarlet fever mainly, ranged between 3 and 4 per cent. Of these cases, 25 per cent. occurred within the incubation period; 60 per cent. arose independently of any ascertained cause and "appeared to have been due to visitors." The small number of contact cases (15 per cent. of the total) Agassiz ascribes to the open-air methods of treatment.

(3) An analysis of the admissions to the North-Eastern Fever Hospital (661 beds) for twelve months (October 1933, to September, 1934) is summarised in Table I.

Although scarlet fever and measles were epidemic in London throughout the greater part of the period, chicken-pox was the disease chiefly responsible for the numerous cross-infections shown in Table I.

TABLE I.—*Admission to North-Eastern Fever Hospital in Twelve Months*

—	No.	Admissions per cent.
1. Total admissions	5712	—
2. Diagnosis doubtful (isolated)	639	11·1
3. Double infection on admission (isolated)	180	3·1
4. Incubating second disease and inadvertently admitted to open wards.	172	3·0
5. No. of cross-infections arising from 4 ..	221	3·8

As extraneous infections, the common fevers provide problems for the medical administrator rather than for the clinician. Chicken-pox, rubella, and mumps are negligible as causes of mortality, and although diphtheria, scarlet fever, whooping-cough, and measles are regarded as the four major specific infections of children, their relative importance as causes of mortality has declined very greatly during the past seventy years. Even if one of these four infections does make its appearance in a ward, passive immunisation of contacts is possible in the case of three of them—*viz.*, diphtheria, scarlet fever and measles.

An analysis of 118 consecutive introductions of specific cross-infections into open wards of the North-Eastern Hospital is set out in Table II.

TABLE II.—*Cross-infections*

Disease.	No. of introductions.	No. of ward outbreaks	Remarks.
Diphtheria.	32	0	Schick test, swabbing and virulence tests, passive immunisation of contacts.
Scarlet fever.	36	0	Dick test, swabbing for carriers of hæmolytic streptococci, passive immunisation of contacts.
Measles.	7	3	Adult immune serum used for prevention or attenuation.
Rubella.	7	1	Outbreak among adolescents, not young children.
Whooping-cough.	23	0	—
Chicken-pox.	13	9	Two outbreaks followed admission of children who developed herpes zoster.

It should be added that in this hospital the space between bed-centres is not less than twelve feet, and, in some wards, fifteen feet. The factor of wall space in the dissemination of upper respiratory tract infections will be referred to again.

NON-SPECIFIC INFECTIONS

The incidence in children's wards of extraneous acute infections other than the specific fevers must ordinarily be stated in general terms, so varied is their ætiology and so diverse are their clinical manifestations. Hutinel [5] long ago recognised that the chief enemy of children in hospital was the streptococcus, and emphasised the gravity of the results of dissemination of respiratory, gastro-intestinal, and cutaneous infections. All are agreed as to the outstanding importance of infections of the upper respiratory tract, although, as Spence [6] remarks, a respiratory or tonsillar infection which may be harmless in a five-year-old child may become very serious when transmitted to an adjacent infant.

Whatever their clinical results, the incidence of gastro-intestinal and cutaneous infections is lower by far and their control much easier than those of the respiratory tract.

Primary *gastro-intestinal* infections chiefly occur, as Paterson and Nabarro[7] have shown, amongst infants from three to nine months and, as Nabarro and Signy[8] have pointed out, attacks of gastroenteritis and ileo-colitis are frequently dysenteric. They find that the Sonne strain is often responsible and this has been my own experience in recent years.

The introduction of diarrhœa or dysentery into a children's ward may be unavoidable, but save in those very exceptional cases where the source has been a infected milk-supply, dissemination is due to defective nursing technique.

From the point of view of dissemination the most troublesome *cutaneous* infections are pyococcal—e.g., impetigo contagiosa and infantile "eczema" so-called. Hutinel and Rivet[9] state that, failing rigorous aseptic precautions, a patch of infantile eczema may be the source of rapidly fatal broncho-pneumonia or septicæmia not only in the original patient but amongst other children in the ward. Schwartz[10] records that of 10 infants admitted to hospital for the treatment of infantile eczema four died of fulminating broncho-pneumonia and two of intestinal intoxication. Impetigo may be a cause of prolonged detention in a fever hospital. Unless the primary case is promptly isolated, carelessness in, for example, the matter of towels may result in transference to other children.

Owing largely to the work of the school medical service and its associated dermatologists, tinea tonsurans and scabies are now of comparatively rare occurence in the wards of fever hospitals where so many children are of school age. Early detection of microsporon ringworm is now easy by means of the mercury vapour lamp with Wood's glass which is available in all the infectious diseases hospitals of the London County Council.

Neither of the foregoing groups is to be compared in importance with extraneous infections of the upper respiratory tract. Brennemann[11] is of opinion that the major cause of hospitalism in infants to-day lies in infections of the upper respiratory tract and their complications and he thinks that a significant ætiological shift may have occurred from the gastro-intestinal to the respiratory tract with diarrhœa and indigestion as prominent symptoms common to both.

Parsons[12] considers that while the chief causes of death in the first half of the neonatal period are antenatal, in the second half they are mainly the result of postnatal infection particularly of the respiratory system, the source of which is to be found amongst those who have charge of the child, thus agreeing in the main with the conclusions of Cruickshank[13] as to the major causes of neonatal mortality. Bruce Young[14] notes the remarkable liability of the London slum infant under the age of three months to infection of various mucous membranes due to bad hygienic conditions. Diarrhœa and vomiting may be the most serious manifestation of the catarrhal syndrome and he thinks that sputum, possibly infected with the hæmolytic streptococcus, gives rise to an infective gastritis particularly in association with outbreaks of influenza in the winter months.

During the biennial epidemics many fever hospitals now admit large numbers of children suffering from measles who thus provide opportunities for study of the incidence and transference of concomitant upper respiratory tract infections. It must be emphasised, however, that infants under three months of age very rarely indeed contract measles and thus representatives of the youngest age-groups who occasion so much anxiety in general children's hospitals are but few in the measles wards of fever hospitals. Among infants between three and six months of age measles is frequently modified. All the gradations observable in measles artificially attenuated by human immune serum may be noted in attacks of the natural disease amongst this group who presumably still possess remnants of maternally transmitted passive immunity. After the age of six months, measles is usually unmodified. The high mortality of young children is caused, of course, not directly by the specific viral infection but by concomitant or superadded bacterial infections. The rôle of the virus in the common cold or measles is, according to Shibley, Mills, and Dochez[15] to cause initial inflammation and so facilitate the activities of the common coccal organisms always present in the nasopharynx. The virus of measles rapidly dies; its presence in the blood in the early stages of the disease stimulates the production of specific antibodies which in a few days render the child solidly immune to a second attack. Unless the primary attack has been very greatly modified in the partially immune infant or too much attenuated by serum, second attacks of measles are, to say the least, extremely rare.

The medical administrative problem provided by the hospitalisation of measles is thus to reduce the dissemination of concomitant upper respiratory tract infections to a minimum.

On the continent the dire results of hospitalisation recorded by such observers as Wladimiroff[16] and Debré and Joannon[17] were recognised as being due mainly to overcrowded wards and the remedy was found in segregation and asepsis. Duncan Forbes[18] considers that so alarming is the mortality of measles patients in hospital, chiefly because of the rapid dissemination throughout the ward of organisms giving rise to fatal broncho-pneumonia, that unless they can be nursed in cubicles or under open-air conditions they will do better at home. The allowance of space in the wards upon which he founds his conclusions is not stated. Peters,[19] however, compared two groups of measles patients admitted from poor homes, a good many suffering from complications. Of 167 children who were nursed in a large ward of 26 beds with an allowance of 1400 cubic feet of air space and 96 square feet of floor space and were thus in his view "not overcrowded," 23 died, a case-mortality rate of approximately 14 per cent. A further 150 unselected patients were treated in an isolation ward containing four cubicles with four beds in each. Of these patients only 6 died, a case-mortality rate of 4 per cent.

That the treatment of measles patients in open wards is not necessarily associated with a high case-mortality is shown by the experience of the infectious diseases hospitals of the London County Council. In London, measles patients have been admitted to the fever hospitals formerly under the control of the Metropolitan Asylums Board, but now under that of its successor the London County Council, since 1910. Within recent years the successive epidemics of measles in London have been described by Sir Frederick Menzies in a series of special reports,[20] and Brincker[21] has discussed fully measles mortality with particular reference to London and to hospitalisation. The numbers of measles patients admitted and the case-mortality in recent epidemics are indicated by the following figures:—

Epidemic.	Cases admitted.	Case-mortality per cent.
1927–28	8,729	7·0
1929–30	6,512	6·5
1931–32	11,526	5·6

The complete figures of the 1933–34 epidemic are not yet available, but to the North-Eastern Hospital alone during nine months (October, 1933, to June, 1934) 1603 measles patients up to the age of fifteen years were admitted. The case-mortality was 5 per cent. Table III. shows the cases divided into age-groups.

TABLE III.—*Measles Patients Admitted to the North-Eastern Hospital up to the Age of 15 Years during the Nine Months, October, 1933, and June, 1934*

Age-group.	Cases.	Deaths.	Case-mortality.
0–½	24	2	8·3 per cent.
½–1	200	25	12·5 ,,
–2	590	45	7·6 ,,
–3	333	6	1·8 ,,
–4	210	6	2·8 ,,
–5	107	2	1·8 ,,
5–10	127	—	—
10–15	12	—	—
	1603	86	5·0 ,,

The graphs which have been constructed from the quarterly figures summarised in Table III. show that neither in numbers nor in age-incidence were the admissions during the period October to December, 1933, comparable with those of the two succeeding quarters (Fig. 1). The epidemic had not gathered way and the children admitted did not fairly represent the normal age-incidence of the disease when epidemic. The graphs constructed for the two succeeding quarters, although of different dimensions, are almost identical in form and reflect, with considerable accuracy, the age-incidence of measles during that epidemic. The number of fatal cases in each age-group is shown in black; none occurred amongst children over five years old. The lessened incidence of broncho-pneumonia upon admission during the April–June quarter due purely to seasonal causes accounts for the low case-mortality rate which was only 4·3 per cent. as compared with 6·8 per cent. in the October-December quarter and 5·7 per cent. during January to March. As already stated, the case-mortality based upon the figures for the whole period of nine months was 5 per cent.

It may be, as Cameron [22] remarks of the 1931–32 epidemic, that the large number of patients admitted probably indicated less discrimination in the removal of patients to hospital. In any case, it is obvious that the great majority must, of necessity, have been nursed in ordinary wards; to provide cubicle accommodation upon such a scale is not feasible.

The wards in which these patients were nursed were of the simplest "temporary" pavilion type, abundantly cross-ventilated by windows looking out upon grass airing courts. The normal complement of a ward was twenty patients. At the height of the epidemic no more than two additional cots were permitted and these were placed in the centre of the ward in such a way that whether lateral or central in position 12 feet was always maintained between cot centres or cot heads. Children with broncho-pneumonia were nursed in the open wards throughout; those with otitis media or enteritis were nursed "in barrier" within the ward in the first instance, but, as soon as possible, were removed to special wards in the case of otitis media or to cubicles in the case of enteritis.

Experience showed that the aggregation of children with ear discharge in a special ward brought dangers of its own. It was observed that after each fresh admission there was a tendency for other discharging ears to light up; obviously they had become reinfected almost certainly by manual transference. In one such ward accumulation of these foci of hæmolytic streptococcal infection culminated in an outbreak of scarlet fever, there being no other discoverable source of infection. At the same time, it must be pointed out that the removal of children with discharging ears to special wards did reduce potential sources of infection in the ordinary measles ward.

The predominant concomitant organisms recovered in routine swabbings of the nose, throat, or discharges from the ear either upon admission or at later stages were hæmolytic streptococci. Even in the April-June quarter during which the incidence of respiratory complications upon admission showed the usual seasonal decline, 40 per cent. of all children admitted to one ward over a period of three months harboured, at the time of admission, hæmolytic streptococci in the upper respiratory tract, the organisms frequently being present in pure culture. Helmholz [23] in a special group of children suffering from upper respiratory tract infections recovered hæmolytic streptococci in 49 cases out of 98 (50 per cent.). He thinks that the mere presence of these organisms is of no significance. If, however, they form at least 10 per cent. of the flora they may be of ætiological importance.

Griffith [24] concludes that the invasion of a human

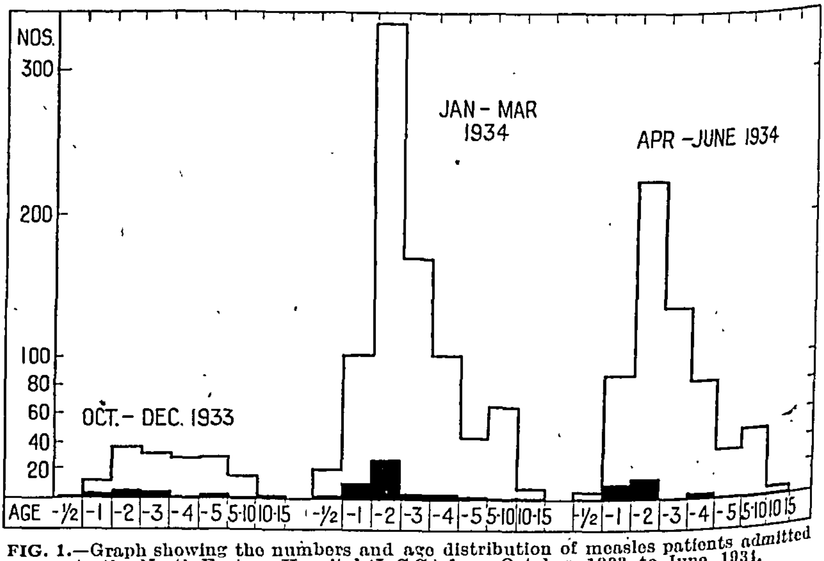

FIG. 1.—Graph showing the numbers and age distribution of measles patients admitted to the North-Eastern Hospital (L.C.C.) from October, 1933, to June, 1934. (Black columns indicate deaths.)

community by a hæmolytic streptococcus of known serological type and its spread amongst individuals forming the community may produce a whole series of clinically different diseases. In any measles ward foci from which upper respiratory tract infections may be disseminated by one means or another are obviously abundant. As the result of consecutive field swabbings of the same children at an interval of days, evidence was obtained that dissemination of hæmolytic streptococci had in fact occurred after admission, although the infection was not necessarily or ordinarily of sufficient magnitude to produce clinical effects. The uncomplicated case of measles must be regarded as, potentially, a minor focus of infection. The major foci are those children who are suffering from the complications of the disease. Their infectivity is greater, and since these are the patients who require most attention from the staff, the opportunities for spread by mediate means are more numerous.

The higher the proportion of children actually suffering from or developing complications at the time of admission the greater the risk of transference of infection to children admitted with uncomplicated attacks of measles. Although, without a doubt, some children develop complications late in the attack as the result of the extension of an upper respiratory tract infection which was present at the time of admission, many of the complications of late onset must be debited to hospitalisation; the upper respiratory tract has been infected or reinfected in the ward.

Incidence of Complications

The three main complications of measles are broncho-pneumonia, otitis media, and enteritis. As to whether, on admission, broncho-pneumonia was developing it was not always easy to be sure and we were frequently able to avail ourselves of the opinion of Dr. Helen Mackay who was at the time making independent investigations upon vitamins. Systematic examination upon admission of the drum-heads of all children in her wards enabled Dr. Hilda Linford to obtain early evidence of middle-ear infection which did not necessarily result in perforation and discharge, but, in what follows, otitis media is synonymous with otorrhœa. I have assumed that complications occurring during the first week of disease, which meant in practice that they were present upon admission or became evident within two or three days thereafter, might fairly be agreed to be beyond the control of the hospital, but that those appearing during the second week or later of the disease must be regarded as of true post-admission origin. An analysis of the incidence during nine months of the three main complications amongst 1464 patients up the age of five years has been made; over that age, complications were both clinically and statistically negligible. The numbers of children in each age-group are the same as those already given in Table III.

Summarised, the analysis shows that the incidence of *broncho-pneumonia* upon admission or within the ensuing two or three days was, at the ages up to five years, 12·3 per cent. with a case-fatality rate of 30 per cent. It is notable that no infant in the small group of 24 under six months old had broncho-pneumonia on admission or developed it subsequently.

Infants of from six to twelve months showed an ncidence of 17·5 per cent. and the high fatality-rate of 51·4 per cent. Amongst children aged from one to two years the incidence (17·3 per cent.) was practically the same but the fatality-rate, 36·2 per cent., improved. Compared with those of children up to one year of age the incidence and fatality-rates of broncho-pneumonia amongst those of from two to five years old were both approximately halved.

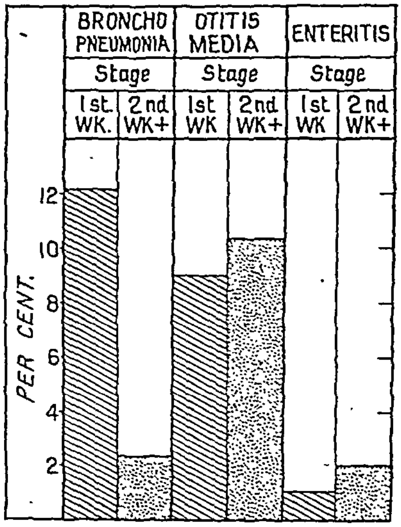

FIG. 2.—Percentage incidence of measles complications in first and subsequent weeks of the disease (North-Eastern Hospital).

Broncho-pneumonia of *late* onset (second week and onwards) occurred in 39 cases, or 2·6 per cent. of the admissions up to five years of age. The fatality-rate was 28 per cent. With the exception of one fatal case in a child of five years, the deaths occurred entirely amongst those aged from six months to two years.

Otitis media (otorrhoea) was present upon admission or occurred very shortly afterwards in 7 per cent. of all cases up to five years of age. Here the maximum incidence (20·8 per cent.) fell upon infants under six months old. It was 7 per cent. among those aged from six to twelve months; 9·3 per cent. from one to two years; 5·4 per cent. from two to three years and fell progressively from that age onwards to 2·8 per cent. among children from four to five years old. Otitis media of *late* (post admission) onset occurred in 8·6 per cent. of the whole series. In the various age-groups the incidence was as follows; under six months, 12·5 per cent.; six to twelve months, 11 per cent.; one to two years, 8·3 per cent.; two to three years, 6 per cent.; three to four years, 9·5 per cent.; four to five years, 10·3 per cent. The fluctuations were thus very much less in the different age-groups than was the case in otitis media of early onset and this is possibly suggestive.

There were no fatalities directly ascribable to ear complications in either the early or late group; nevertheless the clinical importance of this complication is obvious. Administratively, otitis media is the most important complication of measles. The frequency of its late occurrence is to the medical administrator a sensitive index of the character of the nursing in the ward. Some wards containing children of similiar age-distribution consistently produced many and others very few cases of late otitis media. The normal days' stay in hospital of children with uncomplicated measles was 14 days, but since it was our aim to release no child with a discharging ear or, if possible, with an unhealed drum head, it is clear that the average days' stay of all cases was increased considerably by the occurrence of this complication.

Enteritis, presumably secondary to an upper respiratory tract infection, occurred as an early complication in 1·5 per cent. of all children up to five years of age. The fatality-rate was 33·3 per cent. Except in infants under six months of age broncho-pneumonia was a usual concomitant in the fatal cases. The incidence was practically confined to children up to the age of two years. Only 2 cases occurred above that age.

Enteritis of *late* onset occurred in 30 cases (2 per cent.). Four of these cases were actually Sonne dysentery; an explosive outbreak in the five-year group, the origin of which was not traced. Apart from these four cases, the incidence of enteritis late in the attack of measles was entirely confined to children of from six months to three years. There were no fatalities amongst the 30 cases. The percentage incidence, early and late, of these three complications is shown in Fig. 2.

It seems reasonable to conclude from the foregoing results that adequate ventilation and a space between bed or cot-centres of 12 feet are not in themselves sufficient to prevent the dissemination of upper respiratory tract infections amongst measles patients if patients suffering from broncho-pneumonia are nursed in the ward. If it be held that under such conditions broncho-pneumonia, as a late complication, results from the aerial transmission of infection, then it is clear that any lesser spacing must be inadequate. *But ventilation and bed-spacing are not the only* factors in limiting the dissemination of upper respiratory tract infections in measles wards; they do not directly influence the spread of infection from children suffering from otitis media. From such a focus spread is not aerial but manual.

The types of upper respiratory tract infections, their dissemination in wards and the means of control available it is proposed to discuss in the next lecture.

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SOUTHAMPTON MUNICIPAL HOSPITAL.—An extension to the nurses' home, providing room for another 40 nurses, has been opened at this hospital.

KENT AND CANTERBURY HOSPITAL.—The Duke of Kent has laid the foundation stone of the new building of this hospital, which has been associated with East Kent since 1793. The existing accommodation, provided by a building erected nearly 150 years ago, is now inadequate. For seven years efforts have been made to raise the £120,000 required for a new hospital and £30,000 remains to be collected. The building will be in the form of a triangle, the sides of which will face south, east and west and it will be constructed largely of concrete.

DEPRESSION OF MUSCLE TONUS

AS THE CAUSE OF ATELECTASIS, FAILURE OF THE CIRCULATION, AND OTHER POST-OPERATIVE SEQUELÆ

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TONUS is one of the essential conditions of life. More fundamentally than any other feature, tonus differentiates a living man from a corpse. Many of the reflexes depend upon the existence of tonus and are abolished with its loss. Posture, particularly the ability to stand erect, is largely dependent upon tonus. It is loss of tonus that renders an acutely ill patient incapable of getting out of bed, or even of sitting up without assistance. The strongest man, after undergoing an abdominal operation, is for a time unable even to lift his head from the pillow. His condition expresses an acute depression of tonus.

These facts are such commonplaces of daily clinical observation that their fundamental significance is generally unrealised. Accompanying or following any considerable depression of tonus, and in general correspondence with the degree of depression, other post-operative sequelæ also occur. The lungs are partially deflated, and some degree of atelectasis commonly develops. The circulation is more or less depressed. Metabolism, heat production, oxygen consumption, and carbon dioxide production are all diminished. And it is now becoming evident that for all of these conditions there is one general cause: depression of the tonus of the musculature of the body.

MUSCLE TONUS AND RESPIRATION

As Hess[1] has pointed out, the movements of breathing have less the character of voluntary contractions of the respiratory muscles than they have of alterations between higher and lower degrees of tonus in these muscles. This is particularly the case in the diaphragm. It is probable that from the first breath of life until after the last the diaphragm is never for an instant completely relaxed.

How completely the maintenance of the inflation of the lungs and the prevention of atelectasis are dependent upon the tonus of the thoracic muscles and diaphragm may be illustrated by the following observations, which were made some years ago during a study of various methods of manual artificial respiration.[2]

A cat was placed under moderate chloroform anæsthesia; its trachea was connected with a small spirometer; and the volume of air breathed in a minute was recorded. A fatal dose of chloroform was then quickly admistered; and respiration and the heart action stopped finally. When the trachea was again connected with the spirometer, and artificial respiration was again performed by squeezing the thorax and abdomen, a nearly normal volume of air was at first expelled from the lungs; and when the pressure upon the thorax was released, the same volume of air was drawn in again. This inspiration was entirely due to the elastic recoil of the thoracic muscles and diaphragm. But, as the centres in the nervous system failed under asphyxia, the elasticity of these muscles was gradually abolished; and the thorax was re-expanded less and less. A progressively diminishing volume of air was drawn in each time that compression was released, until after about ten minutes, when the body was entirely flaccid, there was no movement of air whatever in or out of the lungs. Compression of the thorax and abdomen by the operator's hands then caused no air to be expired, for the chest was already deflated. And no air was drawn in; for the elastic recoil of the muscles was abolished with the entire loss of tonus.

This loss of tonus, abolition of elasticity and collapse of the chest are not mere laboratory observations on animals. A similar observation has been made by Dr. H. W. Haggard[3] on a man just dead from a heart attack. At first manual artificial respiration expelled air from the lungs, and the tonic elasticity of the chest drew air in again. Then as tonus decreased, the elastic recoil diminished until the thorax was deflated down to the size natural in a corpse.

A similar, if less extreme, observation was made twenty years ago upon normal men as part of a regular class exercise for medical students.[4] The manual prone pressure method of artificial respiration was applied by one student to another; and the volume of pulmonary ventilation thus induced was determined. This volume was found to be in all cases almost exactly the same as that of natural breathing. This observation was at first very surprising until its explanation was found. It means that in a normal man the respiratory centre regulates the tonus of the thoracic muscles and diaphragm with such precision that the chest expands to exactly the degree needed, alike after each normal expiration and each artificial compression. The pulmonary ventilation is thus adjusted not only to supply oxygen, but also to remove exactly the amount of carbon dioxide that the body produces: no more and no less. The subjects then performed voluntary forced breathing for a couple of minutes, so as to over-ventilate the lungs. Thereafter quite involuntarily they breathed subnormally for a time, or even stopped entirely. And when artificial respiration was applied during this period of apnœa, it was found that very little air was moved out of the chest and correspondingly little was drawn in.

These observations have recently been verified by X ray pictures[5] which show that in apnœa, after forced breathing, the position of the diaphragm is that of normal expiration, or even more deflation. Evidently the elasticity that normally keeps the thorax expanded is not a mere mechanical condition; it is rather a vital property under the control of the nervous system and particularly of the respiratory centre. Under normal conditions the chief stimulus to that centre is carbon dioxide. If that stimulus is diminished artificially by over-breathing, the tonus of the respiratory muscles is correspondingly diminished. In the far greater depression of tonus that follows long anæsthesia and extensive surgical operations, the chest cavity is so much decreased that the lungs are nearly deflated. A healthy man, even in expiration, has more than twice as much air in his lungs as a corpse.

In accord with these statements, observations upon patients by a number of observers[6] have shown that after surgical operations the vital capacity—that is, the maximum volume of air that a patient can inhale and exhale—may be decreased by as much as 50 per cent. In this decrease it is evident that the relaxation of the diaphragm plays a major part; for in X ray pictures its shadow may be nearly 5 cm. headward from its normal position.[7] This is as far as, or even farther than, the diaphragm moves under the most forcible voluntary expiration.

From these observations it is clear that, when the tonus of the body is diminished, the size of the thoracic cavity is likewise diminished. If the lungs are sufficiently deflated, some degree of atelectasis, at least in minute de-aerated areas, necessarily results: areas that are easily and quickly reinflated when the lungs are again expanded with the return of body tonus. This condition in its simple uncomplicated form has been well termed "collapse without symptoms."[8] When it is looked for, it has been found after more than 80 per cent. of all laparotomies. Doubtless the non-striated muscle-fibres in the walls of the airways also lose their tonus, like those of the alimentary canal, and such peristaltic movements[9] as they may normally have cease.

MASSIVE COLLAPSE

With the lungs partially deflated, it sometimes happens—and this occurrence is apparently one of pure chance—that mucus accumulates until one or another of the major airways is completely closed. In the lung or lobe which is thus occluded another development then sets in. The occluded gases are absorbed into the blood until the lobe or lung is completely collapsed. As one lung collapses, atmospheric pressure inflates the other lung. Hence, massive collapse is almost necessarily confined to one lung; for the collapse of one lung tends to expand the other.

The absorption of air from an occluded lung is not a physiological reaction, like the development of the atelectasis that generally precedes it. It is instead a purely physical process.[10] The sole causative condition is a plugged airway. An occluded lung is collapsed by diffusion of its gaseous contents in exactly the same manner that a lung, which has been collapsed by pneumothorax, is reinflated by the diffusion of air out of the pleural space. In both cases the gases—oxygen, carbon dioxide, and nitrogen—diffuse into the venous blood because the partial pressure of the gases in the occluded space are higher than in the blood. Blood pressure plays no part.

Relief of massive collapse requires removal of the plug, either naturally by coughing or artificially by bronchoscopy.[11] The return of tonus in the respiratory muscles—particularly the diaphragm—reinflates the lung by re-expanding the thorax. Deep breathing promotes coughing.

Normally the lungs drain freely through the airways and thus eliminate infection. In massive collapse, if the airways are not soon reopened, an occluded infection may develop and usually terminates fatally.[12] In such cases the sequence of events is: anæsthesia and operation, depressed muscle tonus, partial deflation of the lungs, blocking of a major airway, massive collapse, undrained infection, toxæmia, and death.

MUSCLE TONUS AND THE CIRCULATION

Depression of the circulation, like atelectasis and depression of general metabolism, is a common accompaniment of diminished muscle tonus. But it is only recently that it has become possible and logical to infer a causal relation between muscle tonus and the circulation. In this relation the circulation presents two closely related problems: one the converse of the other. One is the problem of how in health the normal circulation is maintained and its total flow adjusted to the varying needs of the body. The other is the problem of how in illness and vital depression the circulation fails.

Beside the heart and the vasomotor mechanism there is a third major factor in the circulation.[13] It is the factor that normally determines the volume of blood returning to the heart through the veins. It is now generally recognised that the depression of the circulation that follows surgical operations or illness is not due primarily to weakening of the heart, nor to failure of the vasomotor nervous control of the blood-vessels. It is due rather to a gradual decrease in the volume of blood returning to the heart—that is, to the progressive depression and final failure of the venopressor mechanism.

Every movement of the limbs and every contraction of the abdominal muscles tends to promote the flow of blood through the venous system back to the heart. This feature of the venopressor mechanism has indeed long been recognised. But clear evidence has only recently been developed that in the healthy body, even during complete bodily rest, the tonic contractions of the muscles maintain continually a pressure within the tissues sufficient to send a continuous stream of blood through the veins to the heart.[14] This pressure between the fibres of a muscle under tension arises in much the same way that pressure between the strands of a rope is produced by a longitudinal pull upon the rope. The pressure amounts, even in a relaxed but still tonic muscle, to 50–70 mm. of water column. When muscle tonus is increased, the pressure is higher, up to 90 mm. or more. When tonus is abolished, as it is in a moribund man or animal, the internal pressure is also abolished; *and in a dead body prior to rigor mortis it falls to zero.*

The method of measuring this tissue pressure is to thrust a hypodermic needle into the middle of a muscle, usually the biceps, and to determine the pressure required to induce a minute amount of saline to run in. During bodily rest this intramuscular pressure is too small to have any considerable direct effect upon arterial blood pressure, or to oppose *appreciably the flow of blood into a muscle.* But even in a relaxed muscle there is normally sufficient tonus to maintain the venous outflow from the muscle. It is one of the first principles of hydraulics that fluid tends to flow from a place of higher pressure to one of lower pressure; and the greater the difference of pressure the more rapid the flow. Correspondingly the higher the intra-tissue pressure the larger and more rapid the volume of the venous return to the heart; and the intra-tissue pressure *is due to the tonus of the musculature of the body,* skeletal and visceral.

These statements do not deny or question the correctness of the opinion that the entire energy of the circulation during bodily rest is due to the "push from behind" imparted to the blood by the left heart. But in order to push the blood not only from the heart to the tissues, but also onward from the tissues back through the veins to the right heart, it is essential that some of the force imparted by the left heart shall be conserved until the circuit is complete. And so long as the tissues of the body have tonus, elasticity, and an internal pressure, a part of the force imparted to the blood by the heart is retained by the blood in the vessels within and beneath the muscles. It is this force—in addition to the tonus of the capillaries [15]—that presses the blood on into the veins and thus supplies the right heart and supports the circulation. On the other hand, when muscle tonus is depressed or fails, the entire force of arterial pressure is lost in the flaccid tissues and the blood stagnates there, instead of flowing on through the veins back to the heart.

Nor is this all. When the depression of muscular tonus permits the thorax to diminish in size and the lungs to collapse toward atelectasis, another handicap is imposed upon the circulation. The negative pressure of the thorax decreases. So long as the thorax and lungs are normally expanded, this negative pressure is one of the main accessory factors aiding in drawing blood into the right heart. When the tonus of the body is diminished, not only is the positive pressure in the body as a whole diminished correspondingly, but the negative pressure of the thorax also. The effective venous pressure,[16] which is the sum of these pressures, is thus doubly decreased.

The part played by general body tonus is distinct from that of vasomotor tonus. Vasomotor tonus determines the height of arterial pressure. General body tonus determines the volume of the venous return to the heart and thus the volume of the output of the heart.[17] In progressive vital depression it is *general muscular tonus that fails first.* The venous return to the heart is thus diminished. It is only after the volume of the circulation has been thus greatly decreased that arterial pressure falls. Almost to the last the vasomotor mechanism, instead of failing, strives by an extreme constriction of the arteries and arterioles to maintain arterial pressure *in spite of the diminishing output of the heart;* then it too fails.[18] This in brief is the process of circulatory failure leading to the large majority of all deaths.

MUSCLE TONUS AND METABOLISM

The maintenance of body temperature depends upon two forms of regulation: physical and chemical. Physical regulation is effected mainly through the evaporation of moisture from the lungs and skin and through the cutaneous vasomotor adjustments. Chemical regulation is largely effected through variations in the process of combustion which affords the energy for muscular contraction and tonus. And the consumption of oxygen and production of carbon dioxide are the chemical correlatives of this liberation of energy. Muscular tonus is thus a prime factor in the chemical regulation of body temperature.

Normally, it is essential that the volume of air breathed to supply oxygen and eliminate carbon dioxide, and the volume of blood circulated to transport these gases shall be adjusted to the amount of energy liberated in the body and to the amount of material oxidised. It now becomes evident that tonus largely determines all of these processes and adjustments: the intensity of metabolism, the amount of oxygen consumed and carbon dioxide produced, the volume of blood put into active circulation through the venopressor mechanism, and the volume of respiration that will afford the amount of ventilation required for the blood as it passes through the lungs.

On the other hand, when tonus is depressed, all of these functions are depressed and thrown out of adjustment. Metabolism and heat production are diminished. Less oxygen is consumed and less carbon dioxide is produced. The venous return is decreased and with it also the output of the heart. Respiration is depressed and the lungs are partially deflated.

FACTORS INFLUENCING TONUS

The tonus of striated muscles is controlled through the motor nerve-fibres from anterior horn cells in the spinal cord. Upon these cells there are many influences: influences from the cerebrum, cerebellum, and basal ganglia—particularly the respiratory centre; influences through afferent nerves from the skin, and from the muscles themselves; and chemical influences from endocrine glands, and by the gases and alkali of the blood.

Among the influences inducing depression of tonus are anxiety, anæsthesia, particularly spinal anæsthesia, or unskilful inhalational anæsthesia and excessive relaxation—and surgical trauma.

Tonus returns fully only with recovery of vitality and health; but it is increased temporarily by frequent change of position—even turning over in bed—by strychnine and by inhalation of carbon dioxide.[19]

CONCLUSIONS

The main cause of all the depressions of function after anæsthesia and surgical operations lies in the decreased tonus of the musculature of the body.

Decreased tonus of the thoracic muscles and diaphragm induces deflation of the lungs. In extreme deflation a bronchus may become plugged with mucus. Absorption of the occluded air then produces massive collapse.

Decreased tonus of the muscles of the limbs and abdomen permits the blood to stagnate in the tissues. The venous return to the right heart is thus diminished, and the circulation is correspondingly depressed.

Decreased tonus of all the muscles of the body involves a decrease of metabolism, heat production, oxygen consumption, and carbon dioxide production. The suboxidation and acapnia may then induce further depression of many functions.

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TORSION OF THE SPERMATIC CORD IN INFANCY

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Torsion of the spermatic cord is uncommon and usually occurs during adolescence and early adult life. It has seldom been recorded in an infant.

REPORT OF CASE

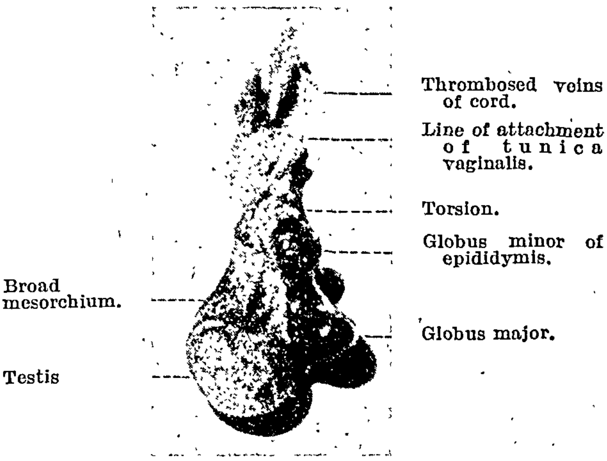
A. B., aged 17 weeks, was admitted to the Blackburn Royal Infirmary as a case of strangulated inguinal hernia on Nov. 19th, 1933. At the age of 2 weeks a swelling had been observed in the left groin; this was diagnosed as a maldescended testicle and no treatment was advised. The child was always fretful and undernourished, and the doctor advised surgical treatment, thinking that a coincident inguinal hernia might be the cause of the trouble. This advice, however, was rejected a fortnight before admission. On the day before coming into hospital the child cried almost continuously and vomited once. Next morning the mother noticed that the swelling appeared larger and, as the child seemed to be in pain and had vomited twice, consented to its removal to hospital. The bowels had been opened regularly each day and the vomitus had consisted of curdled milk.

On admission at 6 P.M. the temperature was 100·6° F. and the pulse-rate 140; the child was screaming with pain. Nutrition was rather poor; the tongue was clean and moist, and the abdomen was not distended or tender. A swelling was visible in the left inguinal canal, about 1½ in. long and 1 in. in diameter. The overlying skin was flushed and there was slight œdema over the external abdominal ring. Palpation of the swelling was obviously painful and disclosed a hard fixed mass which did not fluctuate and which was out of reach of the finger inserted into the external abdominal ring. There was no impulse on straining and the percussion note was dull. The testicle and scrotum were normal on the right side but the left side of the scrotum was small and no testicle was found.

A *diagnosis* of torsion of the left testicle was made on the following grounds: (1) The symptoms and general condition of the infant were not sufficiently severe to be compatible with a strangulation of 36 hours' duration. (2) The swelling was harder and more irregular than the usual strangulated hernia and it seemed unlikely that there could be a strangulation of the omentum in a child so poorly nourished. (3) The doctor had detected a maldescended testicle in the inguinal canal some months previously. (4) There were no septic foci to account for the presence of enlarged glands and clinical evidence was against an adenitis.

Operation.—Permission having been obtained for an orchidectomy the inguinal canal was exposed under ether anæsthesia. A bluish-black mass was seen in the upper part of the inguinal canal which, on dissection, was found to consist of a distended tunic vaginalis filled with blood-stained fluid. The testicle and epididymis were plum-coloured, and the spermatic cord was rotated through one and a half turns from without inwards; the highest part of the torsion was just distal to the attachment of the tunica vaginalis to the cord. Detorsion was impossible and hot packs failed to restore circulation; accordingly orchidectomy was performed. The lower pole of the tunica vaginalis was connected to the fundus of the scrotum by a thin ribbon-like band which was thought to represent the gubernaculum. A small funicular hernial sac was present but its orifice barely admitted a probe. The child made a normal recovery and was discharged on the tenth day.

Dissection of the specimen.—The veins of the cord were thrombosed above the level of the attachment of tunica vaginalis and detorsion of the cord resulted in tearing of these veins. The tunica vaginalis was enlarged and reached nearly one inch above the upper part of the epididymis so that the latter and the testis were suspended within the vaginal cavity. The testis and epididymis were engorged and were attached to each other only by a broad band running from the globus major to the upper pole of the testicle. The vessels of the cord bifurcated in this broad mesorchium to reach the two parts of the organ. Microscopical examination showed extensive interstitial hæmorrhage into the testis and epididymis; the seminiferous tubules were solid cords of cells in the centre of which there was some degree of necrosis.


Thrombosed veins of cord.
Line of attachment of tunica vaginalis.
Torsion.
Globus minor of epididymis.
Broad mesorchium.
Globus major.
Testis

Photograph of specimen removed at operation. (× 2.)

ÆTIOLOGY OF TORSION OF THE TESTICLE

Scudder [1] in 1901 found 31 cases on record, 2 of these being in babies of under one year of age. Donovan,[2] in 1930, recorded 3 cases of his own in infancy and found a further 163 in the literature, in 13 of which the age was less than a year. Johnson,[3] in 1931, reported 2 cases in adolescence, and in the same year Kenneth Walker [4] described a case of bilateral torsion in a boy of 15. Muschat [5] reported 2 adolescent cases in 1931 and discussed the ætiology. Henderson and Foisie [6] reported a case of torsion of a maldescended testicle in a baby of ten months old in which a large congenital hydrocele in the opposite side of the scrotum had caused discomfort and had been relieved by tapping two months previously. The youngest case on record is that of Taylor [7] in which the nurse noticed a swelling and discoloration of the scrotum 4 hours after the birth of the infant. At operation, 48 hours later, a necrotic testicle was removed and the child lived.

Two types of torsion are described: (1) *supravaginal*, in which the whole tunica vaginalis with its contents rotates within the scrotum; and (2) *intravaginal*, in which the testis and epididymis rotate within the cavity of the tunica vaginalis. The former type can occur only after rupture of the areolar tissue binding the tunica to the scrotal wall with tearing of the gubernaculum; the existence of this type is doubted by Muschat, and Young [8] states that the condition could be caused only by severe external violence. Intravaginal torsion of the cord may occur in normally descended or ectopic testicles, but Thorek [9] found that 47 per cent. of the recorded cases were in maldescended organs. The normal testis cannot rotate owing to the firm attachment of the mesorchium to the postero-internal wall of the scrotum.

Farr [10] considered that the predisposing factors were: (1) A free-lying testis with an abnormally long mesorchium. (2) Abnormality of the relative size or position of the testis and epididymis. (3) Enlargement of the tunica vaginalis. (4) Lengthening or other abnormality of the spermatic cord. Broadening of the cord was considered to be a factor by Lauenstein,[11] and Kocher [12] noted that there was often a bifurcation of the vessels of the cord.

Muschat studied the problem by making serial sections of the cord and the cremaster muscle and then constructing models from the sections.

> It was found that, in cases of torsion, the cremaster muscle wound spirally around the cord as far as the testicle, instead of looping down over the outer side of the tunica vaginalis as in the normal specimens. He also found that the tunica vaginalis was attached higher along the cord and was enlarged, thus allowing the testis and epididymis to invaginate the sac from its upper pole. The testicle and epididymis were surrounded by the tunica and hung into its cavity "like the clapper in a bell," instead of being covered only on the antero-external surface as in normal cases. There remained, therefore, a freely suspended testicle attached by an elongated intravaginal portion of the spermatic cord to the upper part of a capacious tunica vaginalis. Contraction of the cremaster muscle would be sufficient to initiate rotation in the unstable testicle.

From these observations the predisposing factors were held to be: (1) high attachment of the tunica vaginalis along the cord; (2) testis and adnexa hang in the cavity of the tunica "like the clapper in a bell"; (3) the cremaster muscle winds spirally round the cord and can thus initiate rotation if the other factors are present.

Johnson has described cases in which a fall or coitus have been the cause of the torsion. Farr considered that the torsion might result from increased abdominal pressure in an effort, by nature, to remedy the imperfect descent of the testicle. Murray,[13] after reviewing the literature, suggested that many cases of acute strangulation had suffered from repeated attacks of recurrent, subacute torsion which had spontaneously been corrected and thus considered that most cases of torsion were of congenital origin. The testicle had many opportunities of undergoing torsion in its descent, and Murray suggested that the torsion was present at birth but that the onset of acute symptoms was due to vascular congestion associated with the period of puberty or with strain. The occurrence of torsion during sleep, as recorded in so many cases, appears to negative this view.

PATHOLOGICAL RESULTS OF THE TORSION

Putzu [14] found experimentally that torsion of 360° for 30 hours caused necrosis of the seminiferous tubules, and clinical evidence supports this finding. Venous congestion and thrombosis follow upon the damage to the thin-walled veins; exudation into the substance of the organs and into the vaginal cavity increases the stasis in the vessels; capillary hæmorrhages occur, and the delicate cells of the seminiferous tubules undergo irreparable necrosis after an ischæmia lasting about thirty hours. Rarely a superadded septic infection of the necrosed organ occurs, and may lead to peritonitis if there is an adjacent patent funicular process. Clute [15] grouped cases into (*a*) acute complete torsion and (*b*) recurrent subacute torsion. In the milder cases, about 14 per cent. of acute complete torsion, in which the vascular obstruction is not sufficient to cause gangrene he found that atrophy of the testicle occurred. Many patients have learned to correct by manipulation the recurrent subacute torsion of the testicle.

DIAGNOSIS

Constantin and Dalous[16] collected 53 cases in which a correct diagnosis had been made in 3; Thorek reports 24 cases of torsion which had been diagnosed as strangulated hernia; 15 of these were cases of ectopic testis. Most cases are diagnosed as strangulated hernia, but the degree of shock and the intensity of the gastro-intestinal symptoms are less in torsion and there is never absolute constipation. Scudder considers that in a doubtful case the absence of the testicle from the scrotum combined with an empty external abdominal ring should lead to a diagnosis of torsion rather than strangulation. Vanverts[17] states that differentiation is impossible between torsion of an ectopic testicle and strangulation of omentum in an inguinal hernia.

Donovan found that in infancy torsion of the cord may be apparently symptomless; in 2 of his cases there was no evidence of pain or vomiting, and the infants were brought for treatment because of the detection of a lump in the groin.

Differentiation has to be made, in cases of scrotal testis, from acute epididymo-orchitis, but in these the onset is more gradual and there may be confirmatory evidence such as urethral discharge, prostatitis, or a history of mumps. Inguinal adenitis may simulate torsion of an ectopic testis but can be excluded by the mode of onset and the presence of a septic focus.

TREATMENT

Detorsion should always be attempted unless there is obvious necrosis, and the application of hot, moist pads may assist in assessing the viability of the organs after untwisting. Donovan holds that orchidectomy will be necessary in all cases after torsion of thirty hours. If detorsion is possible some method of fixation is indicated to prevent recurrence, but it is doubtful if the performance of the Thorek[14] operation for fixation into the thigh would be justifiable in these acute cases. Kenneth Walker advocates exploration of the opposite testis to remedy any predisposing factors in that organ.

No fatal cases are on record.

I desire to thank Dr. Keith Cumming for permission to report this case.

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THE SQUINT TRAINING CLINIC OF THE L.C.C.

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THE squint training clinic was started in connexion with the ophthalmic clinic of the Children's Hospital in Harrow Road in 1915. It was up-hill work because the parents did not understand that the vision of the squinting eye became lost, and, by long association, they did not realise how great was the disfigurement. The treatment too was new to them, and they disliked intensely to have the good eye covered. Few people, even among medical men, realise that marked internal squint, even with good sight in that eye, means that the squinter is in the position of a one-eyed man as regards his field of vision, which makes it dangerous for him to be in any occupation where accidents are liable to happen. I had to spend a long time explaining to each parent, and often when I had succeeded with the mother, the father refused permission for treatment. In 1917, however, the L.C.C. took over the clinic and I was able to devote myself entirely to these cases and the work went on apace as it became more generally known in the neighbourhood.

The cases are nearly all convergent concomitant squint, constant or alternating. I do not like the term "convergent," which implies a coöperation between the two eyes, whereas the exact opposite is the case. In cases of squint the power of convergence and of divergence is either absent (as in alternating squint) or deficient in varying degrees.

If one could coin a word, "abvergence" would more accurately describe the action of avoiding the object seen by the good eye. The term convergence should be confined to the action of the two eyes focussing the same object at the same instant, and in the following pages will be used in that meaning.

Children are very rarely born with a squint. The earliest in my own experience was a child brought to me at 3 months old, who was said to have squinted as soon as she had opened her eyes. The most common age is 3½ to 4 years old, but squint may occur at any age from early infancy to 6 years old. Squint acquired after this age is slight and as a rule is easily cured.

As soon as a child is seen to squint, he should be taken in hand at once; and attempts to restore the sight of the squinting eye should be made without delay. The earlier the squint occurs the greater is the loss of sight. Babies of the tenderest age can wear spectacles with safety, and after wearing them have been known to resent, in the only way open to them, any neglect in putting them on. No child is too young for treatment for the restoration of sight, and in this clinic mothers of squinting children are allowed to bring younger ones with the same defect as soon as it is seen without waiting until the child attains school age.

Before beginning treatment the willing coöperation of the child must be obtained as well as that of the parent. With this aim the mother is asked to listen while an explanation is made to the child in simple language of the meaning of a squinting eye: the loss of sight, the disfigurement, the disability it causes in later life.

His interest and ambition are awakened by telling him that unless the sight is restored and the eye becomes straight he will never be able to enter the railways, become an engineer or work in a machine-shop, drive a train, a car, or an aeroplane with safety, nor be able to become a policeman or a soldier; and in order to stimulate his present interest, he is promised a prize when the eye can read a certain line on the board. One must also show sympathy with him and praise his bravery and manliness in submitting to the discomfort of having to wear a patch, and let him realise that one is just as anxious to take it off as he is. At each visit he is commended for improvement, and if after a certain time has elapsed and none has taken place, searching questions are put as to when he "peeps" or removes the glasses. He is kindly and reproachfully reproved, reminded of the prize awaiting him, and as a rule this handling succeeds and he becomes fond of the trainer and tries to please.

Treatment

The basis of the treatment is that described by C. Worth in his book on squint. It consists of two different parts: (1) the restoration of vision to the squinting eye; (2) training the eyes to focus on the same object at the same instant.

RESTORATION OF VISION TO SQUINTING EYE.

The errors of refraction are most carefully corrected.

Where there is any loss of vision in the squinting eye, the good eye is covered by a disc of paper gummed over the lens of the spectacle, extending above to the eyebrows and across the bridge of the nose. It is unwise to cover the extreme outer field of the good eye. The child needs peripheral vision on that side in order to avoid knocking against objects he is passing. The paper projects beyond the lens so that it is difficult for him to turn his head for the use of that eye in direct vision. The complete covers supplied by opticians and advised by some surgeons are dangerous, as well as depressing to the spirit of the child.

The paper is renewed every week and the vision taken until the sight reaches 6/9. It is then replaced by a film of shaving soap rubbed over the lens. By this time the vision of the squinting eye is so useful that there is little inclination on the part of the child to use the good eye. The soap is kept on until the squinting eye can "fix"—i.e., the patient can use that eye to focus an object with both eyes uncovered and *without spectacles.* The question of fixing is more important than that of vision, for in some cases of bad scotoma the vision never arrives at 6/6, and if the good eye is kept covered beyond the stage of fixation the vision of the good eye may deteriorate, and actually become the squinting one, while the other may still not improve to normal. A girl of 5 who had so little vision in the squinting eye that she could not see fingers at the distance of one foot, and a very large central scotoma, had the sight restored until that eye apparently became the fixing one at will, the other going into the corner. The child was most unreliable, and it was difficult to find out her distant vision but she could read Ji. It is probable that the scotoma has not entirely gone and that she uses a portion of the retina at the inner side of the yellow spot. If further covering were done now, the good eye would lose its vision without corresponding improvement in the other.

Some ophthalmic surgeons claim that training should begin when vision is so much as 6/12, and that the sight is thus more quickly restored. I have not found this to be so *unless the eye can also fix.* When using the amblyoscope the weaker eye loses the object and the child carries on only with the good eye. This is the cause of many cases of faulty projection which rarely occurs unless the sight of the bad eye is less than that of the good one, or cannot fix; or again in cases of bad alternating squint.

Moreover if training is carried out when there is a loss of one image (constantly in the same eye) this image has to be continually illuminated more brightly than the other, involving the use of artificial light, which is quite unnecessary if the standard of a "fixing" eye is adhered to.

Certain cases of children of 10 and upward who are unable to spend the time from lessons in regaining the sight of the eye may lose the squint by training to the point of absolute cure, but the vision does not improve in the same ratio. Two little girls, twins of 11, with marked internal squint and vision of 6/60 and 6/36 respectively, kept the patches over the good eyes until the bad ones obtained 6/24 and 6/18 respectively. Then they felt unable to continue on account of their school work. The patches were removed and the children have had training for several months. There is now no squint either with or without glasses, but the vision of the first girl is now only 6/24, that of the second 6/12.

Children with central scotoma and vision very much less than 6/60 cannot be treated with much success after they are 6 years old. They improve, and if it were possible to ensure that the treatment was being really carried out, I believe one could gain success with children older than this. But it is a very trying and long treatment for a child of that age, and would require so much supervision that it is impossible with the children of the clinic.

Some surgeons allow the child to wear the patch only half the day. I have found this to be almost useless. The great difficulty is to get the child used to wearing it; if he does this constantly he becomes accustomed to it and ceases to fret; but when it is removed every day, a constantly repeated irritation occurs, and the temptation to "peep" proves irresistible. Moreover the necessity for wearing it is discounted, not only by the child, but also by the parents and teacher who become impatient of the much more prolonged treatment.

Where there is no scotoma and a vision of 6/60 it is amazing how much children improve up to the age of 9 or even 10 years of age.

I have just discharged a boy who was 9 years and 10 months old with a vision of 6/60 when he first came. He arrived at 6/6 with entire disappearance of the squint in ten months. Another boy of 9 improved from 6/60 to 6/6 in six months.

Training should be thoroughly done even if the squint has disappeared in these cases, because the habit of using one eye only is so ingrained that they must be taught to use the eyes together, and frequent tests of the vision must be taken in case of loss. The custom of the clinic is to "soap" between the weekly training until the habit is broken.

Time taken to restore sight to the defective eye.—During the first seven years of the clinic children with no central vision and seeing less than 6/60 took on an average 21 months to restore vision to normal. One case took 3 years and the shortest time was 6 months.

In the later years of the clinic this average was reduced to 18 months, an improvement I put down to the greater knowledge of the parents of the treatment, and perhaps also to my own added experience. The average for children with 6/60 or better vision has been as follows:

Vision.	Average time.	Vision.	Average time.
6/60	13 months.	6/24	9 months.
6/36	12 ,,	6/18	7 ,,

Those with better initial vision were improved to normal in correspondingly less time.

There are no failures with this treatment provided it is well carried out, and of course with due regard to the age at which the treatment is begun. The clinic was started with the desire to find out how far it is necessary to limit the age of the child at which treatment can be undertaken with success, and experience has shown that pessimistic forecasts are quite unjustifiable.

TECHNIQUE OF TRAINING

The technique of training the eyes to focus on the same object at the same minute may be divided into 3 parts: (*a*) acquiring of binocular vision (B.V.); (*b*) training of con- and divergence; (*c*) acquiring of stereoscopic vision.

Acquiring Binocular Vision.—When the sight of the squinting eye has been made equal to that of the straight one, or is able to fix, the power of binocular vision is investigated by means of the amblyoscope. The first series of pictures consists of, for example, a bird on one slide and a cage on the other, and the like. By moving the arms of the amblyoscope the pictures advance towards one another until they coincide so that the bird is seen as if inside the cage. When the child sees the bird in the cage, both eyes are then focused on the same spot and binocular vision *at that point* has been obtained, both eyes turning towards the nose at the same angle. When this stage has been reached, the eyes have to be taught to adduct and to abduct at the same time and equally.

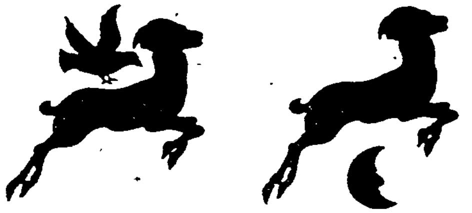

FIG. 1.—Series 2 A. For horizontal deviation.

Training of Con- and Divergence.—For this purpose the second series of pictures has been devised (see Fig. 1). Each pair has a large central figure, such as a goat, a horse, an engine, while above one figure is a smaller object, such as a bird, and below its pair is a dog, &c. When the two central images coincide only three objects are seen, the central image with the smaller figures above and below. These small ones should be very definite and compact in outline so that when the arms of the amblyoscope move to and fro, they tend to keep the two central images as one, thus developing the power of true con- and di-vergence.

Both these movements are deficient in this form of squint but it is better to begin with the training of convergence; it is easier and more effective. Binocular vision having been obtained, the child saying he sees one goat, with a bird above and a moon below, the arms of the amblyoscope are slowly and steadily pressed together, while the trainer urges the child to keep the bird and the moon in position above and below the goat. He must be constantly questioned as to what he sees, and the questions must be changed in form, in tone of voice, and in manner, so as to prevent the child from answering mechanically. When making these questions one must have a very definite knowledge of what the child sees, and be on the alert against being deceived, for with the best will in the world to speak the truth, the child may deceive unconsciously. Moreover the eyes tire quickly and must have frequent rests. Ten minutes at the most is all that can be done while the child is honestly striving to keep the images together, and one must be on guard that the tired eye does not go in (and produce "faulty projection") while still the child continues to give apparently satisfactory answers. One would imagine that where the eye goes in, one's first effort would be to separate the eyes by moving the arms apart, but it will be found that making the eyes truly converge gives much better results than attempting to make them diverge Force convergence and in a short time divergence may be begun.

Fatigue, both ocular and mental, is a reason for not allowing the child to handle the amblyoscope himself, especially in the second series of slides. In the first series, that of putting the bird into a cage, convergence and divergence are not practised and there is no possibility of the child not understanding what is to be done, nor of doing it in the wrong way, nor is it tiring. Where binocular vision is absent, and this especially in alternating squint with no loss of vision, one can give the amblyoscope to the child and let him try for half an hour at a time. He must be made comfortable, sitting lower than a table on which he can rest the elbows. The eyes do not get tired because there is no training of the act of convergence, merely that of binocular vision in one particular position.

Where there is an upward squint as well as an inward one, the best slides have a vertical central figure, such as a tree, upright line, or a pillar-box, with a figure on opposite sides of each pair of slides (see Fig. 2). This obviates raising or lowering one arm of the amblyoscope or its corresponding picture, and causes the errant eye to come down to its proper level.

After con- and divergence have been trained to the fullest extent with a range of quite 90 degrees as gauged on the scale of the amblyoscope, stereoscopic slides are shown, and the patient is carefully questioned as to what he sees. One must, in this as in the second series, get into the mentality of the child and realise in one's own mind what he is seeing. On obtaining stereoscopic vision, the eyes are straight when looking through the amblyoscope, but may revert to the bad position the instant it is taken away. This is especially the case with alternating squints when B.V. was absent at first, and was attained with great difficulty. One of my worst failures was a girl of 5, with good vision in each eye and an extreme squint in either alternately. It took three years before she could get the bird in the cage, but after that she obtained a great range of convergence, and stereoscopic vision, so far as one could determine; but the squint was nearly as large when she left at the age of 14 as when she came. This was a case on which I was very anxious to have an operation; unfortunately the child was terrified and has steadfastly refused, but there seems little doubt that after this training the result would be a great success, although these are the very cases which are so difficult to cure by operation if there has been no preliminary training.

Alternating squints, with very little or no error of refraction and good vision in either eye, are the most difficult. They have usually no B.V. and it may take years before this can be obtained and when advanced to the second series may acquire an immense range of true con- and divergence; while working with the amblyoscope, the eyes appear to be perfectly straight, but immediately go back to the old position on ceasing to do so. If these children are seen daily, a month or two makes a rapid improvement in the position of the eyes, but these children only attend once a week, and frequently miss even that, while holidays cut down the attendance to only nine months in the year. Operation after training in these cases has been most successful and I advise it whenever the squint persists after full con- and divergence and stereoscopic vision have been acquired.

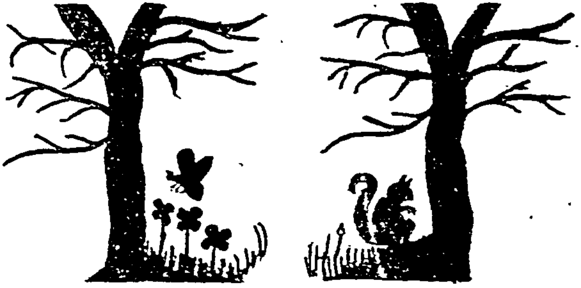

FIG. 2.—Series 2 B. For both horizontal and vertical deviation.

The treatment by amblyoscope is not as easy as it sounds. It requires a very long experience of many cases and immense patience and understanding; also a knowledge of the infinite mistakes and misunderstanding to the child is liable. Cases with good B.V. and convergence are easy and require no great skill on the part of the surgeon. But children with no B.V., who lose first one image and and then the other, and in the second series cannot get any range of con- and divergence have to be helped by the surgeon's understanding of their difficulties, by special ways of showing the pictures and of moving them to and fro, and by judgment of what the child is really seeing, no matter what he says.

The large instruments with electric light and coloured pictures and with innumerable gadgets for moving separately the arms in different directions are nothing more than glorified amblyoscopes and are not more efficient than amblyoscopes properly used, and a good many of the gadgets are not at all necessary. The pictures are not artificially lit in my clinic, and the arms of the amblyoscope need have no separate movement if the pictures I suggest are used. But the more elaborate instruments have many advantages. The children like the coloured pictures, and are more interested in them. The position of the eyes is better shown, and the surgeon is not obliged to assume a cramped position nor to hold the instrument for the child to look through. I find too that the ordinary amblyoscopes quickly become maladjusted; one arm may be higher than, or twisted slightly in relation to, the other. When using it, the surgeon should look through it himself before showing it to the child. The larger instruments, being more fixed, have not these defects. I should like to suggest that a much simpler form might be made with fewer gadgets, which would be equally effective and not so expensive. The simpler and cheaper they are the better, since the establishment of squint-training clinics in every district where there are many children is greatly to be desired. Ordinary stereoscopes are of no use whatever until the child has obtained stereoscopic vision with the amblyoscope. The same may be said of choreographs, but these supply an interest and change for the children and are useful in that way.

When the eyes are straight (i.e., no squint when the glasses are removed) and good con- and divergence have been obtained as well as stereoscopic vision, the child is discharged for six months. He is then called up again, and the eyes examined for loss of vision, or squint, or loss of ability in amblyoscopic exercise. If these are normal he is discharged for a year, and at the end of that time, if there has been no retrogression he is discharged permanently. Sometimes the sight may have gone back, but a few weeks or months of "soaping" brings the vision to normal again, and he is given another course of training. When this is satisfactory he is discharged for another six months, but not permanently until a year has elapsed without any retrogression. For training it is not so necessary to begin at an early age as it is for the restoration of vision, for cases of cure have occurred when training has been begun as late as 13 and 14, while certain adults gain great benefit from it. I consider the best age to begin in alternating squints is about 8 years old, but where sight has been restored in the squinting eye, training should follow on such restoration without waiting.

Results

The results tabulated in Table I. are taken from current and past records of patients treated in the clinic since 1924. Unfortunately most of the records of discharged patients was lost during 1928.

The results tabulated in Table II. are taken from short private notes of cases of which fuller records are among those lost and are therefore set out in less detail.

Results in 210 *cases dating from* 1924

1. Straight on restoration of vision	41	(19%)
2. Straight after training	113	(53%)
3. Straight with glasses, slight squint* without ..	17	(8·1%)
4. Slight squint with glasses	13	(6·2%)
5. Much improved	20	(9·5%)
6. Slight improvement or failure	6	(3%)

Children who did not attend for training, or attended so seldom that no effect could possibly result have not been included in the tables.

Group No. 1, although straight on restoration of vision, were found to have great deficiency in the power of convergence, and had a training of a few months only to develop this. Groups 2, 3, and 4, nearly all constant squints, took an average of 11·9 months of squint-training. Groups 5 and 6, were all alternating squints and constituted 13·3 per cent. of the whole; and the time taken in their training averaged 32·3 months.

Some of the patients were very irregular in their attendance and one month may represent only one or two treatments instead of the four or five among the regular attendants. The alternating squints were on the whole more regular in attendance than the others.

Results in 255 *cases dating from* 1915 *to* 1922

1. Straight after training and restoration of vision	171	(67·02%)
2. Slight squint	48	(18·8%)
3. Much improved	28	(11%)
4. Failure	8	(3%)

Among the 8 failures was a family of 4 whose parents both squinted and the whole family was of very low intellect.

The work of the clinic goes to prove that in squinters the centre controlling the power of true convergence of the eyes is deficient. When it is quite undeveloped, alternating squint occurs early in life and training must be carried out until the eyes can converge before any operation should be done. In constant squint there is less deficiency in the centre, and training has been successful in curing most cases. If the squint does not entirely disappear it is reduced to quite negligible proportions.

Any kind of illness, injury, shock, fright, operation, or strain, whether mental or physical, will cause a squint in those with a deficient coördinating centre. I have not found a case of squint occurring after an illness without this deficiency or a very large error of refraction. During treatment, an accident or illness may be most detrimental to the progress already made.

A boy of 5, who had a high error of refraction, and a very large squint, had the sight of the bad eye restored from 6/60 to 6/6 with loss of the squint except occasionally on removing the glasses. He was knocked down by a car, and on his return to the clinic after some weeks in hospital, the squint had returned, he had lost binocular vision and could do none of the exercises. His mother then became impatient and he was taken to a hospital. Even the removal of teeth under an anæsthetic may be followed by severe retrogression.

The feature common to nearly all the children of the clinic is the habit of mouth-breathing. It is rare to have a normal nose-breathing child brought with a squint, and those that are are usually the true alternating squints with a very deficient centre. Moreover, until the child has learnt to keep the lips closed it is very difficult to get rapid improvement in vision, and afterwards to increase the range of convergence. Consequently an important part of the treatment consists in curing this habit. The consequences to the general health and appearance, are pointed out to both mother and child, and in very bad cases, a prize is promised if the child learns to keep his mouth closed. In most this habit is thus cured, although the children are seen only once a week or even less. Operation for enlarged tonsils and adenoids is not advised unless these are septic, because of the bad effect operations have on the progress of the case. When the child learns to keep the mouth shut, the adenoids and enlargement of the tonsils usually disappear. I am convinced that the ill-health, the susceptibility to infection, the frequent colds, bronchitis, and cough, the chronic laryngitis and nervous irritability associated with the mouth-breathing habit are very potent direct causes of squint.

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* Slight squint is one which is not seen without special examination, and to the laiety appears to be straight.

ALKALOSIS ARISING IN TREATMENT OF PEPTIC ULCER

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The use of large doses of alkali in the treatment of peptic ulceration was first described by Sippy[1] in 1915, since when alkalis have held a prominent place in the treatment of this condition and of dyspepsia in general. The occurrence of certain symptoms associated with a raised alkali reserve was observed in some of Sippy's cases by Hardt and Rivers,[2] who in 1923 published the first clinical account of uncompensated alkalosis, recording 16 cases. The clinical picture and chemical findings were fully described in 1932 by Cooke[3] whose 9 cases brought the total on record to 68.

From these introductory remarks it would appear either that alkalosis is rare or that it often passes unrecognised. The object of this paper is to suggest that the second explanation is probably the correct one, and further to draw attention to certain features of alkalosis which in previous accounts have been omitted or insufficiently emphasised.

The present series of 7 cases, collected from the wards of a general hospital, shows the necessity of keeping in mind the possibility that alkalosis may develop in any case taking alkalis regularly, even in moderate doses. Although the dosage of alkali does not vary greatly in the different wards, no less than 5 of these cases were diagnosed by one physician or his assistants, who were on the look-out for the condition, and it is therefore probable that many cases pass undiagnosed, either to recovery or (more probably) to death.

Alkalosis is said to be commoner in men than in women, and of the 7 patients no less than 6 were men.

SYMPTOMS AND SIGNS

Symptoms are both numerous and varied, and are rarely if ever all seen in any one patient or even series of patients. The most characteristic are anorexia, headache, irritability and changes in mentality, nausea, vomiting, aching pains and twitching in the muscles of limbs, and weakness which may amount to prostration. Flushing and perspiration may be present, and, in severe cases, slow respiration-rate, rapid pulse, tetany, and even fits may precede the onset of coma which is usually fatal, the patient dying uræmic.

The headache is characteristic, and is described by the patient as a sensation of weight on the top of the head. The mental changes also deserve brief mention owing to their lack of uniformity; most patients become aggressive and difficult to manage, while others (as in Case 2 below) are confused and disorientated. Case 1 is interesting in this connexion because the first sign of his condition was recognised by the ward sister, who noted the patient's inability to keep his bed tidy.

Tetany, even in latent form, was not observed in this series, but in Case 4 there were two fits, in one of which the tongue was bitten, the reflexes remaining remarkably brisk.

Physical signs.—The patient may be flushed and respiration shallow, but these signs are often absent, and were not noted in any of the present cases. The tongue is dry and furred, and, apart from muscular tenderness and urinary changes, the principal signs are those of increased neuromuscular excitability; these include brisk reflexes, muscular twitchings, and occasionally latent or frank tetany with carpopedal spasms.

Incontinence may complicate severe cases, and occurred for a short time in Case 1. The urine is typically increased in amount, alkaline in reaction, and contains protein and granular and hyaline casts, red and white blood-cells being common but less constant findings. The amount of protein is usually small, but quite large amounts may be present, as in Case 1, and the urine may resemble that of acute nephritis.

CHEMICAL FINDINGS

The alkali reserve is raised from its normal range of between 55 and 75 c.cm. of CO_2 per 100 c.cm. of plasma to 100 c.cm. or even more, the highest value recorded below being 93·2 c.cm. in Case 1. The blood-urea and non-protein nitrogen are also raised in all cases of recognisable alkalosis, and may reach the exceedingly high figures of true uræmia. The chloride content of both blood and urine was found by Cooke to be diminished, but was not estimated in the cases described.

THE CASES

The full list of alkalis used in the treatment of these patients includes magnesium oxide and carbonate, sodium citrate and bicarbonate, calcium carbonate, and bismuth oxycarbonate. As these drugs were given in mixtures of varying composition and dosage it has been decided, for the sake of simplicity, to state the form of alkalis used in each case, and express both the total and average daily intake in terms of grammes of sodium bicarbonate.

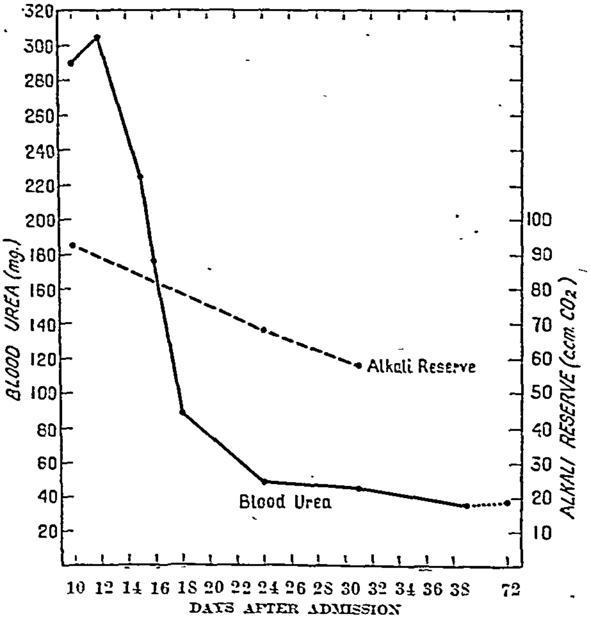

FIG. 1 (Case 1).—Blood-urea (mg. per 100 c.cm.) and alkali reserve (c.cm. per 100 c.cm.) from day of onset of alkalosis.

Case 1.—Male, aged 30. This patient was admitted on account of hæmatemesis, with only three weeks' history of epigastric pain which was continuous and unrelated to food. Hæmatemesis was preceded by melæna on two consecutive days. Examination was entirely negative except for marked anæmia, the hæmoglobin being 54 per cent. Treatment consisted of a modified Lenhartz diet and alkalis. Nine days after admission, after three days' constipation, the patient was seen to be sleeping with his eyes open. Next day restlessness and inability to keep the bedclothes tidy were noted by the sister of the ward, and the same night the patient insisted on getting out of bed to pass urine. This was followed by incontinence of urine and fæces, and alkalis were discontinued. The blood-urea was 290 mg. per 100 c.cm., and the alkali reserve 93·2 c.cm. CO_2 (Fig. 1). Drowsiness and dryness of the tongue were present, and the urine contained protein and occasional red cells, but no casts, and the blood pressure was slightly raised. Ammonium chloride was given for two days in doses of 20 grains four-hourly, but had to be stopped because of a mild colitis. The patient rapidly improved, but eight days after the onset of symptoms granular casts appeared in the urine which had the characteristics of a mild attack of acute nephritis. Red cells and casts persisted for two months, at the end of which the patient had lost all symptoms of both peptic ulcer and alkalosis. X ray evidence of ulcer was never obtained.

Alkalis (powder) ..	Magnesium oxide, sod. citrate and bicarb., and bismuth oxycarbonate.	
Total intake ..	321·6 g. sod. bicarb.	
Average daily intake	40·2 g. ,, ,,	for 8 days.

CASE 2.—Male, aged 38. This patient gave ten months' history of hæmatemesis and epigastric pain unrelieved by alkalis. A month before admission the patient began to vomit, and X ray examination showed the presence of a gastric ulcer. The only abnormality discovered on examination was epigastric tenderness and rigidity. Treatment consisted of modified Lenhartz diet and alkalis, and after one week vomiting occurred daily, the patient complaining of anorexia and a dry mouth. *On the tenth* day, after four days during which the bowels were only opened once, the patient became mentally confused and disorientated, and complained of a sense of pressure on the top of the head and pain in the leg muscles, which began to twitch so that he could not keep his legs still. Alkalosis was diagnosed, and the alkali reserve and blood-urea were estimated, the former being 92 c.cm. CO_2, and the latter 118 mg. per 100 c.cm. (Fig. 2). The urine was strongly alkaline, and contained occasional red cells and epithelial and hyaline casts. Alkalis were discontinued, and acid sodium phosphate was given in doses of 30 grains three times daily with rapid relief of all symptoms except the pain in the legs, which continued for a further two weeks.

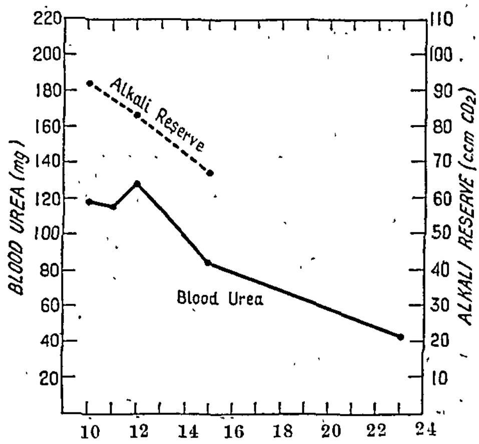

FIG. 2.—Blood-urea and alkali reserve, in Case 2, from day of onset of alkalosis.

Alkalis (powder) ..	Magnesium oxide, calcium carb., sod. citrate, and bismuth oxycarbonate.	
Total intake ..	437·1 g. sod. bicarb.	
Average daily intake	43·7 g. ,, ,,	for 10 days.

CASE 3.—Male, aged 63. In this case there was only one week's history of giddiness and melæna without abdominal pain at any time. Physical examination was negative except for signs of severe anæmia (hæmoglobin 38 per cent.). The urine was normal. Treatment consisted of modified Lenhartz diet, citrated milk and alkalis on which the patient improved for three days. On the fourth day the pulse-rate rose without evidence of renewed bleeding, and alkalis were stopped. On the following day the patient developed parotitis and became irrational. On the sixth day after admission the blood-urea was found to be 140 mg. per 100 c.cm. and the alkali reserve 68 c.cm. CO_2. A blood transfusion was given without improvement, the blood-urea rose to 225 mg., muscular twitchings developed, and the patient died in coma eight days after admission. During the whole period the bowels were only once opened without enemata, which were given on two occasions. Examination of the urine could not be carried out because of incontinence.

Post mortem the kidneys appeared to be normal to the naked eye. On microscopical examination the glomeruli were normal, but the tubules were seen to contain small quantities of lipoid, the tubular epithelium being rather swollen. No other abnormalities were seen.

Alkalis (powder) ..	Magnesium carb., sod. bicarb., and bismuth oxycarb.	
Total intake ..	90·2 g. sod. bicarb.	
Average daily intake	22·5 g. ,, ,,	for 4 days.

CASE 4.—Male, aged 47. This patient gave a typical history of peptic ulcer over a period of five years with melæna for three weeks before admission. Radiography showed a duodenal ulcer. The only abnormal physical signs were epigastric tenderness and rigidity. Treatment was similar to that in the previous cases, and the patient improved for about a week when he began to vomit. He vomited five times during the sixth and seventh days after admission, and on the eighth, after four days' constipation, suddenly had a fit without aura or obvious tonic or clonic stages. There was no foaming or involuntary micturition, but the tongue was bitten and the reflexes were subsequently found to be very brisk. The urine was normal. Later on the same day a second fit occurred, similar in all respects to the first. Next day the patient was drowsy, his tongue was moist, but headache, muscular pains, and twitchings were absent. The alkali reserve was not determined, but the blood-urea was found to be 142 mg. per 100 c.cm. The urine now contained granular and hyaline casts, but no blood or protein, both of which appeared in small amounts during the next two days. Alkalis were discontinued, and five days after the onset of fits the patient had greatly improved, the blood-urea having fallen to 64 mg. Ten days later the blood-urea was 36, and X rays showed no evidence of ulcer.

Alkalis (powder) ..	Magnesium oxide, sod. bicarb., and calcium carb.	
Total intake ..	438·8 g. sodium bicarb.	
Average daily intake	54·8 g. ,, ,,	for 8 days.

CASE 5.—Male, aged 30. This man gave a typical history of peptic ulceration extending over five years, with hæmatemesis and perforation four years previous to admission. On examination the only abnormal signs were tenderness and rigidity in the epigastrium. The urine was normal. The patient was treated conservatively with diet and alkalis in a surgical ward for seventeen days with relief of pain. Vomiting now became more frequent, the blood-urea was found to be 60 mg. per 100 c.cm., and alkalosis was diagnosed. Alkalis were discontinued, and acid sodium phosphate given in doses of 30 grains three times a day for one day, after which the patient was transferred to a medical ward. During the next two days he developed anorexia, became gloomy and depressed, and complained of a sensation of heaviness in the head. Constipation was marked during this period and for the next nine days, during which the bowels were only once opened naturally. The tongue was dry and furred, but pains in the legs and muscular twitchings were absent. The blood-urea was 60 mg. per 100 c.cm.; the alkali reserve was not determined. The urine at this stage was alkaline and contained granular and hyaline casts, but no albumin or blood. *During the next* five days the blood-urea rose to 100 mg., the urea clearance being only 43·5 per cent. of normal. During the first week following his transference to a medical ward the patient received no acid, and was actually given a drachm of alkaline powder on eight occasions because of abdominal pain. At the end of a week all alkali was withheld, but the patient continued to be irritable and difficult, the tongue remaining dry and a trace of albumin being present in the urine. The blood-urea fell slowly during the next fortnight, at

the end of which it was 65 mg. with a urea clearance of 68 per cent. of normal. One week later the patient was transferred back to a surgical ward because of persistent pain and vomiting, and a partial gastrectomy was performed with considerable difficulty owing to adhesions, two days after which he died of peritonitis. There was no post-mortem examination.

Alkalis (powder) ..	Magnesium oxide and carb., calcium carb. and sod. bicarb.	
Total intake ..	654·4 g. sod. bicarb.	
Average daily intake	36·4 g. ,, ,,	for 18 days.

November	9	12	15	18	21	23
Blood-urea in mg. per 100 c.cm.	60	72	100	70	50	65
Blood-urea clearance per cent. normal	—	—	43·5	—	—	68·0

CASE 6.—Female, aged 76. This patient had suffered for two months from pain after food, anorexia, and vomiting. There was a history of cerebral thrombosis 2½ years previously. Examination was negative except for severe anæmia (hæmoglobin 57 per cent.). The stools were positive for occult blood, but radiography revealed no ulcer. The patient was treated with a modified Lenhartz diet and alkalis, and improved except for frequent vomiting until one month after admission, when she developed retention of urine, and had to be catheterised. At the same time the patient's mental condition was noted to be strange, and she vomited twice. As in the other cases the onset of symptoms was preceded by a period of obstinate constipation necessitating digital removal of hard fæcal masses. Alkalosis was suspected and alkalis discontinued. The blood-urea was found to be 95 mg. per 100 c.cm., but the alkali reserve was not determined. Large doses of acid sodium phosphate were given, and the blood-urea fell to 64, but rose again two days later to 72 with the onset of hæmaturia which was possibly due to excessive acid. One week later the blood-urea had again fallen to 40, the blood-urea clearance being 74·7 per cent., but hæmaturia persisted. The patient returned home at her own request.

Alkalis (mixture) ..	Magnesium oxide, sod. citrate and bicarb., calcium carb., and bismuth oxycarbonate.	
Total intake ..	748·1 g. sod. bicarb.	
Average daily intake	23·4 g. ,, ,,	for 32 days.

CASE 7.—Male, aged 64. This patient was admitted for abdominal pain which had persisted for five years with attacks of vomiting. On examination there was epigastric tenderness and rigidity and severe anæmia (hæmoglobin 30 per cent.). Occult blood was present in the stools. The patient was put on a modified Lenhartz diet and alkalis, and after eleven days became flushed and mentally deranged, restraint being necessary to keep him in bed. Next day the patient was comatose, with a dry furred tongue and Cheyne-Stokes respiration. The urine was normal. The coma deepened, temperature rose suddenly to 106° F., and the patient died three days after the onset of symptoms. During the last eight days the bowels were only once opened, and then with an enema. As the diagnosis of alkalosis was not made until forty-eight hours before the patient's death alkalis were continued up to this time, and the alkali reserve was not estimated, but the blood-urea one day before death was found to be 250 mg. per 100 c.cm.

Post-mortem examination showed a small gastric [illegible] which appeared to be healing. Macroscopically [illegible] kidneys were normal except for slight reduction [illegible] while microscopic examination showed only [illegible] fibrosis, occasional arterio-sclerotic changes, [illegible] small calcareous deposits.

Alkalis (mixture) ..	Magnesium oxide, sod. [illegible] carb., and bismuth [illegible]
Total intake ..	540·5 g. sod. bicarb.
Average daily intake	38·6 g. ,, ,, [illegible]

DISCUSSION

Cases 1 and 2 may be considered [illegible] of alkalosis with raised [illegible] urea. The most interesting features are the persistence in the former of the urinary changes, and in the latter of muscular pains in the legs, for a long while after the other symptoms and signs had disappeared. In Case 3 the alkali reserve was only 68, but as alkalis were stopped two days before this determination was made it is reasonable to suppose that it had probably been much higher. The muscular twitchings, severe constipation, and high blood-urea, in the absence of any pathological changes in the kidney, can best be explained as due to alkalosis, and the amount of alkali taken is at least compatible with such a diagnosis. In the remaining four cases the alkali reserve was not determined, and the diagnosis therefore rests on the clinical picture, the blood-urea findings, and (in Case 7) the absence of pathological changes in the kidneys.

In Case 4 the sudden onset of fits and drowsiness with the appearance of casts in the urine, all of which disappeared after the stopping of alkalis, puts the diagnosis of alkalosis beyond reasonable doubt. The rise and fall in blood-urea which paralleled the onset and disappearance of the clinical manifestations is typical of the condition under consideration. Cases 5 and 6 may be looked upon as mild but definite examples in which the clinical picture and raised blood-urea can best be explained as being due to the large amounts of alkali they are known to have received. The diagnosis in Case 7 was not suspected until just before death, and is based on the absence of any evidence of kidney disease in a patient who was receiving large doses of alkali, and who died comatose [illegible] a high blood-urea. While the evidence is [illegible] stantial it was considered sufficiently [illegible] alkalosis to admit of inclusion in the [illegible]

Analysis of these cases reveals [illegible] in common. In all of them the onset [illegible] was preceded by several days' obstinate [illegible] Apart from any direct relationship [illegible] between constipation and the [illegible] is possible that there may be [illegible] connexion between the [illegible] magnesium oxide or carbonate [illegible] cases of peptic ulcer as a [illegible] constipation without [illegible] more drastic purges [illegible] in 2 of the above [illegible] high alkalinity [illegible] determine the [illegible] that [illegible] all the [illegible] for the [illegible] average [illegible]

[illegible] life [illegible] one [illegible] pieces [illegible] apped [illegible] been [illegible] spital. [illegible] wenty [illegible] fully [illegible] memo larger doses of alkali being taken in the form of powder than are prescribed, because of variations in the size and degree of filling of the spoon used. This source of error has been excluded as far as possible as a causative factor in the cases described, but is one seriously to be considered and guarded against when prescribing alkaline powders to out-patients.

The total amount of alkali taken depends on the period of administration, and is therefore less instructive than the average daily intake. The former, expressed in terms of grammes of sodium bicarbonate, varied between the wide limits of 85·3 and 917·1, the average being 493·2, while the latter, similarly expressed, ranged between 21·5 and 54·8 with an average of 38·1.

In one case the daily intake exceeded 50 g., in two 40 g., in two 30 g., and in two 20 g. While it is impossible to draw conclusions from so small a number of cases it seems possible for alkalosis to develop on relatively small doses of alkali, although it must be admitted that, of the patients receiving only about 20 g., one (Case 6) was an elderly woman with arterio-sclerosis and mild symptoms of alkalosis, while in the other (Case 3) the diagnosis is open to doubt.

It is well known that vomiting tends to produce alkalosis, and, in Case 6, the frequent vomiting (twelve times in fourteen days) which immediately preceded the onset of alkalosis may help to account for its occurrence on such relatively small dosage of alkalis. It is of interest in this connexion to note that the sudden onset of fits in Case 4 followed two days of repeated vomiting. In the remaining cases, however, vomiting was not a marked feature.

The reason why alkalosis develops in some patients and not in the majority treated with equally large doses of alkali is not known, but may be due to a failure on the part of the kidneys to excrete alkalis. It is known that damaged kidneys are particularly susceptible to alterations in the hydrogen-ion concentration of the blood either towards the acid or alkaline side, the range of optimum renal function being considerably restricted, but in none of the cases recorded was there any clinical evidence of previous renal disease, and in the two which came to autopsy no pathological changes of significance were discovered.

Treatment.—Severe degrees of alkalosis can always be prevented if the existence of the condition and the nature of its clinical manifestations are remembered, the bowels of all patients receiving large doses of alkali kept well open and magnesium salts given with reasonable discretion. In any suspected case all alkalis should be withheld, and the alkali reserve and blood-urea estimated without delay. If these are raised, acid should be given in the form of ammonium chloride or acid sodium phosphate, the former in doses of grs. 15–20, and the latter grs. 30–40, three times a day after food, until the alkali reserve, which should be estimated daily, or at least every two days, has returned to normal limits. The protein intake should be limited to about 40 grammes a day, and all food given in fluid or semi-solid form, careful attention being paid to the condition of the mouth and bowels.

Treated along these lines all but the most severe cases should recover, but symptoms such as pains in the legs may persist for several weeks. It is unwise, however, to perform any operation until the blood-urea has been normal for some days.

CONCLUSIONS

The treatment of peptic ulcer by alkalis and diet is occasionally complicated by the occurrence of certain symptoms associated with urinary changes and a rise in the alkali reserve and blood-urea. These symptoms are preceded by a period of marked constipation and, if untreated, may lead on to coma and even death in uræmia. The amount of alkali required to produce alkalosis is usually large, being equivalent, in the 7 cases here recorded, to about 40 grammes of sodium bicarbonate a day; but symptoms may result from smaller doses, especially if there is severe or continued vomiting. The prognosis in cases recognised in the early stages and suitably treated is good, but in the late stages the patients may die in spite of treatment.

I wish to thank the honorary physicians of St. Bartholomew's Hospital for their kind permission to report on cases under their care, and especially Dr. George Graham for much valuable help and criticism.

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Clinical and Laboratory Notes

A CASE OF PNEUMOCOCCAL MENINGITIS

BY DUNCAN LEYS, D.M. Oxon., M.R.C.P. Lond.
PHYSICIAN TO SELLY OAK HOSPITAL, BIRMINGHAM

THE typing of the pneumococcus in cases of meningitis is not undertaken sufficiently often, as a routine, for figures to be available for a large series. Of 11 cases occurring among adults at Selly Oak Hospital during the last two years, all associated with pneumonia, the pneumococcus belonged to Type I. in 9, to Type II. in 1 (in which otitis was also present), and to Group IV in 1 which followed trauma at the base of the skull. All these patients died. In 7 of the Type I. cases serum treatment was attempted, but 6 patients came under treatment too late for hopes of success to be seriously entertained, and died shortly after it was commenced. The seventh survived for eighteen days after a diagnosis of meningitis had been made, and showed at one period striking clinical improvement. The post-mortem appearances were, at the same time, remarkable enough to encourage the belief that cure is a probability if treatment can be undertaken energetically in the early stages of the disease. At least one case of recovery after the use of serum has been reported.[1]

The patient, a male metal-polisher aged 31, was taken suddenly ill on Jan. 20th, 1935, with pleural pain and rigors. Received at hospital at 11 P.M. on Jan. 22nd, he had the typical symptoms and signs of a right upper lobe pneumonia. A mouse was inoculated with sputum the same night, and 60,000 units of serum were given intravenously the following morning (23rd), and 30,000 on the 24th. Blood cultures taken on the 22nd, 23rd, and 24th were all sterile, but the general condition was poor, and cyanosis was present in spite of intranasal oxygen.

On the 25th headache, present in mild form at the onset, became severe, and the spinal fluid was found to be turbid, containing 8000 cells, chiefly polymorphs, per c.mm., and Type I. pneumococcus. 60,000 units of serum were given intrathecally on that day, 60,000 on the 26th, 50,000 on the 27th, and 40,000 on the 28th. Spinal puncture was performed each day thereafter, but no further serum given, until Feb. 2nd, when only 5 c.cm. of fluid could be obtained with difficulty. A cisternal puncture was made on Feb. 2nd and 40,000 units serum

Date.	Blood culture.	Source.	Cerebro-spinal fluid.				Serum (thousands of units).			Condition of patient.
			Appearance.	Cells per c.mm.	Pneumococci.	Culture.	Intravenous.	Intraspinal.	Cisternal.	
Jan. 23rd.	Sterile.	..	..	..	..	..	60	..	..	Symptoms pneumonic.
,, 24th.	,,	..	..	..	..	..	30	..	..	..
,, 25th.	,,	Spinal.	Turbid.	8000	Present.	Pos.	..	60	..	Symptoms meningeal.
,, 26th.	..	,,	,,	..	,,	,,	..	60	..	Headache and muscle spasm decreasing.
,, 27th.	..	,,	,,	..	Appeared dead.	Neg.	..	50	..	
,, 28th.	..	,,	Less turbid.	7800	Few; dead.	,,	..	40	..	
,, 29th.	..	,,	Slightly turbid.	..	,,	,,	..	..	..	
,, 30th.	..	,,	..	6000	None.	,,	..	..	..	Mental confusion, but no loss of consciousness.
,, 31st.	..	,,	..	6500	,,	,,	..	..	..	
Feb. 1st.	..	,,	..	5800	Present.	,,	..	..	..	
,, 2nd.	..	Cisternal.	Slightly turbid.	..	,,	Pos.	..	..	40	
,, 3rd.	..	,,	..	..	..	..	..	..	..	
,, 4th.	..	,,	Slightly turbid.	2000	None.	Neg.	..	..	60	
,, 5th.	..	,,	..	Few.	,,	,,	..	..	..	
,, 6th.	..	..	..	..	..	..	..	..	..	Afebrile. Rational. Sanguine. Complete absence of symptoms.
,, 7th.	..	Spinal.	Turbid.	Very few.	None.	Neg.	..	..	..	
,, 8th.	..	..	..	..	..	..	..	..	..	
,, 9th.	..	..	..	..	..	..	..	..	..	Headache, becoming severe.
,, 10th.	..	..	..	..	..	..	..	..	..	
,, 11th.	..	Cisternal.	Turbid.	..	Present.	Pos.	..	..	60	Collapse and death.

introduced; on the 4th this was repeated, and 60,000 units given. On the 5th cisternal puncture was done, but no serum given. Lumbar puncture was always attempted before cisternal puncture was resorted to.

The nature of the fluid obtained, dosage of serum, and condition of the patient are shown in the accompanying Table.

Spasm of neck muscles and of hamstrings was present throughout, but diminished after Feb. 1st. Headache and mental confusion disappeared on Feb. 6th, but were replaced for 24 hours by depression. From the 7th to 9th he was afebrile, rational, and symptomless, sat up and demanded food. On the 9th there was some headache, which became more severe, and a few drops of spinal fluid obtained on the 11th were turbid. Cisternal puncture was again performed and slightly turbid fluid obtained. 60,000 units of serum were introduced. The patient was in good condition at the end of the procedure (performed under general anæsthesia), but collapsed half an hour later and died in five minutes. At no time was blood observed in the fluid obtained by puncture.

At the autopsy, in striking contrast to the usual appearances of the brain in pneumococcal meningitis, the meninges appeared entirely clean except for a small area, half an inch across, on the extreme vertex, where a small collection of more or less inspissated pus was found. Around the medulla, and filling the foramen magnum, was recent blood clot, the obvious cause of death. There was no hydrocephalus and the lung showed complete resolution. No suppuration was present in the middle ears or mastoid cells.

In this case it seems certain that hæmorrhage was caused by trauma during the introduction of the serum, although one was unaware of any movement of the needle, and this danger must be reckoned as a very serious disadvantage in treatment. On the other hand, it is probable that in every case of pneumococcal meningitis the giving of serum by lumbar puncture will become impossible before adequate treatment has been given, and cisternal puncture become the only means of continuing it. Recovery in one case of Group IV. pneumococcal meningitis has been reported[2] after cisternal drainage by open operation, and this line of treatment, combined with serum in Type I. and II. cases (without which it is unlikely that recovery will take place), seems to give a very reasonable hope of cure. The danger of concealed hæmorrhage is thus removed, and a drainage-tube, which can be opened intermittently, provides an easy method of applying serum directly to the meninges.

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SELF-PERFORMED ENTERECTOMY

By Theodose Ch. Astreos, M.D.
DISTRICT MEDICAL OFFICER, PAPHOS, CYPRUS

The following case is interesting because the method of suicide chosen was unusual and because uneventful recovery followed treatment of a condition seemingly hopeless.

A man, claiming to be 75 years old, was brought into the Paphos Hospital by the police, bleeding from a self-inflicted wound in the abdomen. Three pieces of small intestine wrapped in rags were produced, which had been cut out of the patient's abdomen by himself. He was a beggar, who had been living all his life under miserable conditions, and he often complained that his abdomen was full of bed bugs, which he felt creeping up and down inside his abdomen. He had often been heard threatening to commit suicide or "to cut open his abdomen to let the bugs out."

According to the statement of eye-witnesses, the patient, while sitting by the public highway stripped himself from the waist down, and, using an ordinary pocket knife, stabbed himself low in the abdomen and drew the knife upwards. His bowels protruded and, before any one could prevent him he cut out in quick succession three pieces of intestine, which he threw away. The police wrapped him in some dirty canvas bags, that had just been emptied of animal manure, and rushed him to hospital. The distance was two miles and he was seen about twenty minutes after the attempt.

The patient appeared to be about 65 years old, fully conscious and rational. He was euphoric and his features showed no signs of pain. The pulse was rapid but of fair quality. The abdominal wound looked like a surgical incision, extending from below the umbilicus downwards for about 4 in. in the midline. Two freshly cut ends of small intestine were protruding through it. The mesentery was bleeding profusely, and the wound was smeared with faeces and dust of animal manure.

Two intestinal clamps were placed on the cut ends of the intestine and the bleeding from the mesentery controlled with 18 hæmostatic forceps, which were temporarily left in place. The wound was then covered with hot wet towels and preparations were hastily made for an operation. But the control of bleeding took some time, and before it was completed the patient collapsed. The pulse became threadlike. A subcutaneous injection of normal saline solution was immediately started and 800 c.cm. were given in about thirty minutes. By this time the pulse had improved sufficiently to permit operation under local anæsthesia. Novocain 2 per cent. solution with adrenaline was used while the patient was still collapsed. The ends of the intestine were pulled further out and a lateral entero-anastomosis was performed having cut off from both ends of the intestine about 3/4 in. The anastomosis was then covered with a fold of the omentum and this was fixed to the mesentery with three plain catgut stitches. The wound was once more cleansed with normal saline solution and ether, the incision renewed and lengthened by one inch, the contents replaced into the peritoneal cavity and the abdominal walls closed without drainage.

The three pieces of intestine, cut from one loop, measured 13, 14, and 17 cm. respectively, a total length of 44 cm. The protruded viscera were held in place tightly by the edges of the abdominal wound and this was one of the reasons that justified omission of drainage, the other being the fear that the patient might try to interfere with the wound in a second suicidal attempt.

Because of the patient's state of collapse it was thought that the avoidance of general anæsthesia would not seriously handicap the operation and that it would have the advantage of not permitting the abdominal muscles to relax and the viscera return into the abdominal cavity, increasing the danger of spreading the infection. There was also a slight chance that the rest of the abdominal cavity and contents were not infected.

Subsequent events justified this procedure, for the patient had an uneventful recovery and left the hospital on the fifteenth day, completely recovered. The absence of any fever seems remarkable, and it is interesting to speculate how much resistance to infection this man had accumulated during his long and miserable life as a beggar. Although he expressed no regret for his act and justified it, stating that "he had now got rid of the bed bugs," he later obeyed orders faithfully, when told that disobedience might have disastrous results. He continued to have excellent health and was free from any abdominal symptom when I last saw him.

I have to thank my chief, Dr. Cyril C. H. Cuff, for permission to publish this case.

ORGANISM OF SPIROCHÆTAL JAUNDICE IN A RAT FROM A NORTH OF ENGLAND COAL-PIT

By H. A. Cookson, M.B., F.R.C.S., M.R.C.P. Edin., D.P.H.

HONORARY PATHOLOGIST TO SUNDERLAND ROYAL INFIRMARY

Gulland and Buchanan[1] noted the occurrence of spirochætal jaundice in miners working in wet mines in Scotland. It would appear right to report the finding of an infected rat in a wet seam in the North of England.

On May 28th of this year, the miners' secretary of a lodge in the North of England, was directed to bring a living rat to me. The reason for this action was that one of the lodge members who had worked in a particular seam of this pit, had had an attack of what was (from hearsay), apparently spirochætal jaundice, others formerly suffering in the same way. I cannot better than quote from the secretary.

> "The seam this person worked in is known as the 'X' seam. The average height is 18 in., very wet, and the water lies in pools. At the entrance to this drift, there is a sewage disposal works and a refuse tip. From time to time the rat inspector has visited this place, owing to it being over-run with rats, and laid poison to exterminate them. Nearly every one of the several cases of jaundice has occurred in the same area known as the 'Y' flat in the 'X' seam."

The rat was alive when I received it. It was killed and examined, when it seemed healthy. The bladder was half full, and I examined the urine by dark-ground illumination, and thought I saw one spirochæte. I therefore inoculated a guinea-pig, intra-peritoneally, this on May 28th, 1935. The animal remained well until Friday June 7th, and it died during the night, June 7th–8th; it was noted that there was conjunctivitis and that the animal was jaundiced. Post-mortem examination made on June 8th showed subcutaneous tissues deeply jaundiced, with typical hæmorrhages into the lungs, the so-called "butterfly mottling." Preparations from the liver stained by Fontana's method for spirochætes demonstrated their presence.

Thus the occurrence of cases of jaundice in a wet seam was associated with the finding of *Spirochæta icterohæmorrhagiæ* in a rat caught in the same place.

INHERITANCE OF PHENYLPYRUVIC AMENTIA (PHENYLKETONURIA)

By L. S. Penrose, M.D. Camb.

RESEARCH MEDICAL OFFICER, ROYAL EASTERN COUNTIES' INSTITUTION, COLCHESTER

In a recently published paper[1] I described two brothers who were both idiots and who excreted an abnormal substance in the urine. This abnormal constituent was considered to by phenylpyruvic acid, a ketonic substance previously identified by A. Fölling[2] in the urine of certain imbeciles. The disease appears to be inherited recessively. More than one member of a sibship can be affected; the parents and the normally intelligent sibs do not excrete phenylpyruvic acid. In human populations, if a Mendelian recessive character is rare, practically all individuals in whom it is manifested will have parents who are carriers, that is to say, parents who carry the gene but who do not exhibit the character. In such families a fraction, approaching one quarter, of the brothers and sisters of a person who shows a recessively determined abnormality will show the same abnormality. Furthermore, as Garrod[3] first pointed out in connexion with alkaptonuria, the parents in these families will not infrequently be found to be consanguineous. Phenylpyruvic amentia, more conveniently termed phenylketonuria, is a rare disease and, if it is due to a single recessive gene, these criteria must be satisfied.

The present communication deals with a pedigree which was originally published[4] in order to demonstrate the mode of action of a rare recessive gene in a consanguineous family. Four female aments (previously referred to as four idiots but more correctly described as three idiots and one imbecile) were distributed among the offspring of two interrelated first cousin marriages. It was argued that the defectives represented a rare special type of amentia, hitherto undescribed, and due to a single recessive gene. This conclusion was based upon three observations—namely, the sharp segregation of the affected from the unaffected members of the family, the correct degree of familial incidence of the disease among the sibs, and the effect of consanguineous parentage. The stimulus provided by the recent work of Fölling has resulted in the discovery that the only survivor (generation IV., No. 4, on the attached pedigree Chart) of the four aments in this pedigree is a case of phenylketonuria. It is not unreasonable to suppose that the three aments in this family who have died suffered from the same disease. Dr. J. H. Quastel (who suggested the name phenylketonuria) and Dr. H. A. Krebs have kindly examined the urine of the surviving patient. Phenylpyruvic acid has been identified with certainty and several new problems have been raised which are still under investigation. If the assumption is correct that the three aments who did not survive (III. 3, III. 6, and IV. 7) suffered from phenylketonuria, there can be little doubt that the disease is the expression of a single recessive gene. Since the original publication of the pedigree which is under discussion some further details have been obtained. The Chart has accordingly been revised and a full description of it is appended.

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[1] Buchanan, G., Spirochætal Jaundice. Med. Research Council Spec. Rep. Ser. No. 113. 1927.

[1] THE LANCET, 1935, i., 23.

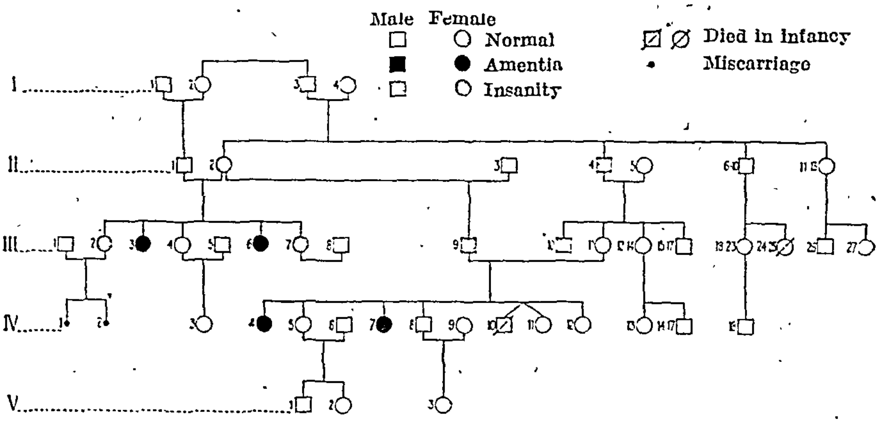
[2] Zeitsch. f. Physiol. Chem., 1934, ccxxvii., 169.

[3] Garrod, A. E.: THE LANCET, 1902, ii., 1616.

[4] The Influence of Heredity on Disease, London, 1934.

The genetical interest [illegible] this family does not cease with the recognition of the relationship between parental consanguinity and the appearance of a rare recessive [illegible] in the offspring. [illegible] recorded the [illegible] of mental disease in relatives of two of his patients. In the instances previously reported by me, the father began to suffer from

A PEDIGREE OF PHENYLKETONURIA



GENERATION I

1. Male; husband of I. 2; said to have been healthy; no further information obtainable.
2. Female; great great aunt of IV. 4; said to have been healthy; no further information obtainable.
3. Male; great grandfather of IV. 4; said to have been healthy; no further information obtainable.
4. Female; great grandmother of IV. 4; said to have been healthy; no further information obtainable.

GENERATION II

1. Male; husband of II. 2; healthy; died aged 81.
2. Female; paternal grandmother of IV. 4; showed signs of insanity when aged 75; died aged 77.
3. Male; no information obtainable.
4. Male; maternal grandfather of IV. 4; farm labourer; chronic melancholia from the age of 50; died aged 83.
5. Female; maternal grandmother of IV. 4; normal, so far as could be ascertained.

6–10. Males; normal, so far as could be ascertained.

11–13. Females; normal, so far as could be ascertained.

GENERATION III

1. Male; husband of III. 2; said to have been in a mental hospital; no details known.
2. Female; aged 59 now; recurrent mania with hallucinations; attacks at ages 23, 53, and 54.
3. Female; idiot—quite helpless; died at age of 4 years.
4. Female; died of peritonitis at about the age of 45; normal mentally.
5. Male; husband of III. 4; no information.
6. Female; idiot; never sat up—quite helpless; died at age of 4 years.
7. Female; suicide at age of 54 during an attack of melancholia.
8. Male; husband of III. 7; no information.
9. Male; father of IV. 4; illegitimate child of II. 2 and II. 3; b. 1866; aged 69 now; farm labourer; had a nervous breakdown at age of 44; has since been unable to work; now suffering from melancholia and chronic nephritis; urine contains no phenylpyruvic acid.
10. Male; b. 1864; farm labourer; melancholia with hallucinations; onset at 51; suicidal; died aged 54.
11. Female; mother of IV. 4; b. 1869; aged 66 now; healthy and mentally normal; urine contains no phenylpyruvic acid.

12–14. Females; normal, so far as could be ascertained.

15–17. Males; normal, so far as could be ascertained.

18–23. Females; normal, so far as could be ascertained.

24, 25. Females; died in infancy.

26, 27. Male and female; normal, so far as could be ascertained.

GENERATION IV

1, 2. Miscarriages.

3. Female; normal; accidental death at age of 14.
4. Female; b. 1894; aged 41 now; imbecile; mental age, judged by Stanford-Binet tests, 4 years 3 months, and by Porteus maze test, 3 years. She is excitable and talkative, stumbles over her words, and uses them in the wrong sense; she can run about, feed herself, and keep herself clean with supervision. Physically she is healthy, has a good appetite, but suffers from excessive sweating. She is small in stature, rather fat, has a mild degree of kyphosis, and is elderly in appearance; she has freckles on her face and hands with several small pigmented nævi on the limbs and neck; the head is small (cranial capacity, 1079 c.cm.; cephalic index, 0·79). The teeth are regular though the enamel is poor and the gums septic. The breasts are fairly well developed and menstruation has until recently been regular. The pupils react to light rather slowly and the ocular fundi are normal; slight coronary cataracts were observed by Dr. A. V. Taylor on examination with a slit lamp. The patient was neurologically investigated by Dr. S. Nevin, who reported that, although all tendon reflexes were exceptionally brisk, there was no definite sign of a pyramidal lesion. The urine contains phenylpyruvic acid.
5. Female; sister of IV. 4; b. 1897; aged 38 now; normal.
6. Male; husband of IV. 5; normal.
7. Female; sister of IV. 4; b. 1900; idiot; never learned to talk but could say one or two words which she used for anything and everything; no fits; unable to walk but showed no definite signs of paralysis; unable to attend to herself; died aged 15.
8. Male; brother of IV. 4; born 1903; aged 32 now; railway clerk.
9. Female; wife of IV. 8; normal.

10. } Twins; sibs of IV.4; b. 1906 { (i) Male; died in convulsions aged 14 days.
11. }   { (ii) Female; aged 29 now; in domestic service; normal intelligence; phenylpyruvic acid absent from urine.

12. Female; sister of IV. 4; b. 1909; aged 26 now; works for a newsagent; normal intelligence; no phenylpyruvic acid in urine.
13. Female; normal.   14–17. Males; normal.   18. Male; b. 1930; normal.

GENERATION V

1. Male; b. 1924; normal.   2. Female; b. 1930; normal.   3. Female; b. 1926; normal.

delusions during the involutional period and the paternal grandfather showed similar signs during senility. The pedigree dealt with in the present communication contains six relatives who showed definite signs of insanity, of which the mean age of onset was about 50 years. Three of these individuals (II. 2, II. 4, and III. 9) were certainly carriers of the gene which produced idiocy in their homozygous offspring. For two of the remaining three (III. 2 and III. 7) the chances in favour of their being carriers are two to one and the chances that III. 10 is a carrier are even. The hypothesis may be advanced that the gene for phenylketonuria is not completely recessive, but that it exerts an influence upon the heterozygotes—the carriers—which predisposes them to mental breakdown. Although the homozygous individuals—the aments—are rarities in the general population, the carriers are much less infrequent and it is possible that a significant proportion of mentally disordered persons may belong to this class.

SUMMARY

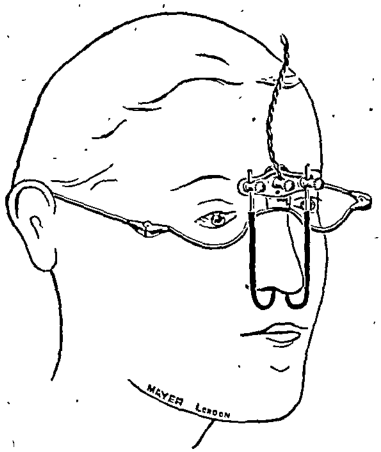
The pedigree of a case of phenylpyruvic amentia (phenylketonuria) has been recorded which demonstrates the mode of inheritance of this condition. A single recessive gene is held to be the cause. Not only does this gene cause amentia when present in the individual in homozygous form, but the heterozygotes or carriers show a marked tendency to develop insanity in the involutional period of life.

The investigation was carried out under the auspices of the Medical Research Council and the Darwin Trust. I am much indebted to Miss D. E. Newlyn for obtaining details of the family.

NEW INVENTIONS

APPARATUS FOR NASAL IONISATION

The apparatus shown in the figure is a modification of that of Mr. Philip Franklin. It consists of a spectacle frame into which fit two nasal electrodes. The advantages claimed for this apparatus are as follows :—



1. It does away with the band which in Franklin's apparatus fixes the electrodes to the patient's head and keeps it in this position for about twenty minutes. My patients used to complain greatly of the inconvenience and discomfort caused by the band, both during and for several hours after the treatment.

2. The frame is applied like ordinary spectacles by the patient himself. It rests on the bridge of the nose, the terminals of the frame, therefore, being always in the same line as the nostrils. This makes the fixing of the nasal electrodes of the frame, after their introduction into the nose, a very precise and easy procedure, and one which causes the patient the least possible discomfort.

Mayer and Phelps, of New Cavendish-street, W.1, have made this apparatus for me.

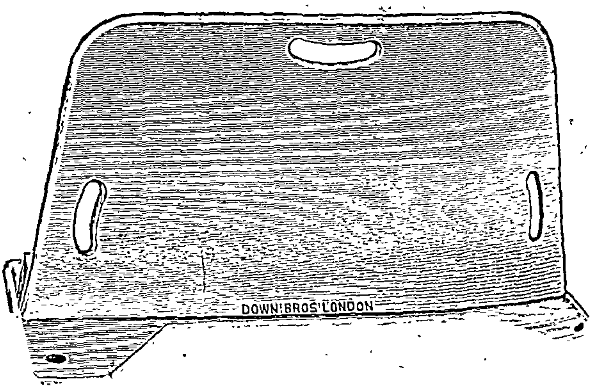
London, W. Arthur Miller, F.R.C.S.Edin.

FRIPP-McCONNEL BED-CLOTHES SUPPORT AND EXERCISER

This apparatus has been designed to serve two purposes: (*a*) To keep the weight of the bed-clothes off the patient's feet, and by supporting the soles of the feet, to prevent him getting foot-drop. (*b*) To help him to exercise certain muscles, while lying in bed, so as to shorten his convalescence when he is up.

The illustration shows the side which should be placed against the patient's feet when it is used as a bed-clothes support. It can be tethered to the bed in such a position that the feet rest comfortably against the vertical board, and so the tendency to foot-drop is guarded against. On the other side there is a bar to support the heels and two diagonally placed battens for the pads of the four outer toes. This side should not be used for too long at a time; otherwise a pressure sore may appear on the heels.

The object of using the support in this way is to prevent deterioration of the muscles while the patient is in bed, and to enable him to regain a good balance and posture when he gets about again. He can thus exercise the following muscles: (*a*) The short muscles of the foot and the tibialis group. (*b*) The quadriceps and gluteal muscles, by pressing his knee downwards against the mattress, with the sole of his foot supported. (*c*) The oblique and transverse muscles of the abdomen which are automatically brought into action by this exercise. A piece of bandage should be tied to the exerciser so that the patient can draw the latter towards him in bed to suit his position.



The support and exerciser can be used with advantage in any case where a patient is confined to bed; but it is particularly useful in long debilitating illnesses when the leg muscles and the sense of balance tend to deteriorate.

Messrs. Down Bros., 21, St. Thomas's-street, S.E., are the makers of the apparatus.

A. T. Fripp, F.R.C.S.Eng.

Norfolk and Norwich Hospital.—This hospital has a deficit of over £10,000, but owing to the success of the contributory scheme the board has decided to push ahead with the erection of new balconies, and it will probably have to enlarge the X ray department.

MEDICAL SOCIETIES

BRITISH ASSOCIATION OF RADIOLOGISTS

THE first annual general meeting and Congress of this association was held on July 12th and 13th, in the University buildings, Birmingham, and was attended by a large and representative gathering of radiologists.

Dr. JAMES F. BRAILSFORD (Birmingham), in his presidential address, traced the progress of radiology through its pre-war, war, and post-war phases, and paid tribute to the early workers in radiology, many of whom had sacrificed their lives to its development. He outlined the objects of the Association and pointed out that in addition to the annual congress at which radiologists from all over the country may interchange views, the Association will provide a medium of coöperation by which the advancement of radiology may be promoted in its ethical, educational and economic aspects. Dr. Brailsford announced that a Fellowship of the Association had been founded, outlined the rules governing admission to this Fellowship, and said that 14 Founder Fellows had been elected, all of whom had already been honoured with high radiological office by their colleagues.

After the presidential address, on July 12th, a visit was paid to the new buildings at the Birmingham Hospital Centre now in process of erection at Bournbrook, where the plans of the new X ray department were inspected.

In the afternoon the association inspected, at the University buildings in Edmund-street, a representative exhibition of radiograms of bone and joint conditions which had been assembled by the president from his own collection and from those of many other members.

CLINICAL PAPERS

On July 13th Dr. R. E. ROBERTS (Liverpool) opened a discussion on Ante-natal Radiology and described his method of cephalometry as a means of estimating the maturity of the fœtus.—Dr. L. A. ROWDEN, of Leeds, gave an account of his method of pelvimetry. Dr. J. DUNCAN WHITE, Dr. C. L. McDONOGH, and Dr. G. VILVANDRÈ took part in the discussion which followed.

Dr. J. H. DOUGLAS WEBSTER introduced a discussion on Methods and results with pre- and post-operative radiation in Breast Cancer. He briefly outlined the development of the methods which had been used in a number of centres; and he quoted statistics of his own and of others from which it appeared that the percentage of five-year "cures" might be doubled after a suitable combined course of radiation and operation, as compared with operation results in similar groups of cases. Several recently introduced methods had given better results than the more primitive technique.

Dr. HARRISON ORTON, Dr. F. HERNAMAN-JOHNSON, Dr. G. VILVANDRÈ, Dr. J. E. A. LYNHAM, Dr. RALSTON PATERSON, Dr. W. BARRINGTON PROWSE, and Dr. W. GRIFFITHS contributed to the discussion which followed.

Dr. S. GILBERT SCOTT read a paper on Spondylitis adolescens, its clinical and radiological features and the results of X ray treatment.

REVIEWS AND NOTICES OF BOOKS

A History of Science, Technology, and Philosophy in the Sixteenth and Seventeenth Centuries

By A. WOLF, Professor and Senator, University of London; Head of the Department of History and Methods of Science. With the coöperation of Dr. F. DANNEMANN, Professor in the University of Bonn; and Mr. A. ARMITAGE, of University College, London. London: George Allen and Unwin Ltd. 1935. Pp. 692. 25*s*.

No reviewer will attempt to deal in any detailed manner with this book; its range is too large, while so many of the sections treat elaborately of technicalities that it would require a team of experts to evaluate, just as it has taken the help of a team of experts to produce them. Prof. Wolf attempts to give a full protrait of the mind of the sixteenth and seventeenth centuries, and one has only to think for a moment of those who were the intellectual leaders of the period, of what they attempted and to what they led their successors, to realise that huge as this volume is it can be but a curtailment of facts in many directions. For in those centuries the foundations of modern science and philosophy were laid. But we find in these pages summaries, and in some cases detailed accounts, of much which was most important in that early work, and which, where it was sound, proved to be largely the foundation on which the wisdom of to-day rests. Astronomy, biology and physics, chemistry, economics and statistics, geology and geography, are the obvious headings of the sections, medicine having a chapter to itself, and properly following on the section devoted to anatomy and physiology. And the way in which medicine is dealt with is an example of the treatment of the various subjects. With strict reference to the period under consideration nothing is said of the fathers of the science and art of medicine, and the earliest workers in anatomy and biology referred to are Vesalius, Servetus, Fabricius, Malpighi, Leeuwenhoek, and certain of their contemporaries. The story of Harvey's discovery finds its place under the heading of anatomy, and is told in the barest outline, but, as always, it is thrilling because of first the logical manner of approach, and, secondly, of the wonderful manner in which the inevitable gaps were later closed in accordance with the original theory. The medical protagonists chosen for mention are, among others, Fracastoro, Sanctorius (inventor of the weighing chair), Glisson, Paracelsus, a pioneer in chemistry, the value of whose work escapes general knowledge, Paré, Mayow, Gilbert, the author of *de Magnete*, Van Helmont, John Locke, and Borelli, while the comment affixed to the list, abbreviated here, is that the majority of the famous doctors enumerated were pioneers in other fields of study than pathology. That is a suggestive reflection to-day, when on all hands it is seen how dependent for any live progress scientific medicine is upon the research work of the biologist, the physicist, and the philosopher.

British Scientists of the Nineteenth Century

By J. G. CROWTHER. London: Kegan Paul, Trench, Trubner and Co. 1935. Pp. 332. 12*s* 6*d*.

THIS is a well-written and interesting little book containing the biographies of Humphry Davy, Michael Faraday, James Prescott Joule, William Thomson, and James Clerk Maxwell, with pictures of the heroes at different stages of their lives. What each of them did and what its value has been to succeeding generations is clearly explained in simple language.

Physical Diagnosis

Seventh edition. By WARREN P. ELMER, B.S., M.D., Associate Professor of Clinical Medicine, Washington University; and W. D. ROSE, M.D., late Associate Professor of Medicine in the University of Arkansas. London: Henry Kimpton. 1935. Pp. 919. 35*s*.

THIS volume is a modernised version by Dr. Elmer of a text-book originally published by Dr. Rose in 1917. The book is divided into two parts. The first 200 pages deal with surface anatomy and inspection of the various parts of the body; there follow chapters on palpation, percussion and auscultation, the reflexes, and special diagnostic procedures such as radiology and electrocardiography. The method of approach to clinical medicine here followed should result in a thorough grounding in systematic observation, though some students, who have ample opportunity of examining patients, will probably find a more compact volume on clinical methods more to their liking.

In Part II. the diseases of the respiratory and circulatory systems are discussed in a similar manner to that usually adopted in text-books of medicine. It is dificult to understand the author's reasons for concluding a book on physical diagnosis with some 300 pages dealing with diseases of the chest alone.

The Modern Treatment of Hæmorrhoids

Third edition, revised. By J. F. MONTAGUE, M.D., F.A.C.S., of the Rectal Clinic, University and Bellevue Hospital Medical College, New York, &c. London: J. B. Lippincott Co. 1934. Pp. 318. 21*s*.

IN its third edition Dr. Montague's well-known book on the treatment of hæmorrhoids shows little change. It gives sound instruction as regards pathology, ætiology, and examination procedures. Operation under local anæsthesia is recommended for the majority of cases, the method being either a catgut ligature operation, or a clamp and cautery. In selected cases of single, small internal piles injection is recommended: the author adheres to his previous technique and recommends injection into the pile mass of 10 per cent. cresylic acid in glycerin and water, or 10 per cent. carbolic acid in olive oil. The submucous injection above the pile of the popular 5 per cent. phenol in oil is not described. Dr. Montague retains a chapter on the treatment of internal piles by insertion of radon seeds, but seeing that he has to admit unsatisfactory results in 12 out of 35 cases there does not seem to be much merit in this treatment: nor does there seem to be adequate reason for re-describing certain electrical methods which the author himself does not find particularly convenient or efficient. Chapter XVIII. on the recurrence of hæmorrhoids is unchanged from the previous edition: the author states that the recurrence-rate is greater after injection than after operation but no definite evidence of this is provided. In a new chapter Dr. Montague speaks with enthusiasm of the adoption of rectal avertin anæsthesia: he has now used it for 578 rectal cases, and although he admits that it does not give as good relaxation of muscles as the inhalation methods it has given sufficient anæsthesia for the usual routine operations, being supplemented sometimes with local anæsthesia. No deaths in his cases have been attributed to the use of avertin.

The book will be of interest and value to many physicians and surgeons, particularly to those who have the experience which will enable them to discriminate between the methods offered. A good deal of obsolete matter could with advantage have been deleted. In particular the columns on differential diagnosis (Ch. VIII.) may prove a stumbling block to the ignorant and trustful: thus in a table on p. 94 we are told that carcinoma of the rectum occurs in patients usually over 40 years of age, bleeding being slight and a barium enema showing an obstructive lesion of the bowel. Unfortunately the variants from this neatly outlined composite picture are so numerous that the table is frankly useless.

Die Krebsbehandlung in der täglichen Praxis

By Dr. ALFRED NEUMANN. Leipzig: Weidmann and Co. 1935. Pp. 354. RM.18.

THIS book is an easily written undiscriminating collection of information about cancer. The general symptomatology is briefly considered, as are the diagnostic points when the disease manifests itself in certain sites. A large number of methods of treatment, general and special, are set out with illustrative cases. The book, we learn from the publishers, has been specially written with a view to being of service both to the research worker and the practitioner, and as a voucher for its standing many columns of names of authorities, mostly German, are quoted. Those of our readers to whom the language presents no difficulty will find here a serviceable compendium.

Illustrative Electrocardiography

By the late JOSEPH H. BAINTON, M.D., formerly Attending Physician and Chief of the Cardiac Clinic, Morrisania City Hospital, New York, and Consulting Physician, St. John's Long Island Hospital; and JULIUS BURSTEIN, M.D., Associate Electrocardiographer, Morrisania City Hospital, and Cardiologist to St. Elizabeth Hospital, New York City. London: D. Appleton-Century Company. 1935. Pp. 258. 21*s*.

THIS is an atlas of electrocardiograms intended for the student and the non-specialist. It contains 155 records, made with a string galvanometer instrument and a continuous film camera, and reduced to about two-thirds of their original size. The reproduction is clear, but it would have been more satisfactory to give full size electrocardiograms of shorter length. The accompanying text is simply a description of the records, beginning with a chapter on the fundamental waves and their time relationships, and proceeding through the varieties of normal curve and most of the recognised abnormalities. The latter are interpreted in accordance with accepted canons. Artefacts and multiple abnormalities are illustrated at the end. The book should fulfil its modest purpose well, and may be recommended to students who have no access to the collected records of a reliable electrocardiographic department.

THE LANCET

LONDON: SATURDAY, JULY 27, 1935

THE REPORT ON THE OSTEOPATHS BILL

ON another page will be found the report of the Select Committee of the House of Lords on the Osteopaths Bill. It should be noted that the report is unanimous, with no reservations, and this is in itself an achievement little short of astonishing when one considers the differing standpoints from which the members of the committee approached their task. They agree that it emerged clearly from the evidence submitted that osteopathy is not, as is popularly supposed, a craft or art limited to the treatment of maladies or defects of the bones, joints, muscles, and ligaments, by manipulation. In this sphere they have no doubt that qualified osteopaths perform valuable services, and, though they do not say so, it is pertinent to add that bonesetters, with no claims to any special form of qualification, may perform services no less valuable. (Incidentally the committee state that they have not been in any considerable degree influenced by evidence either of cures or of failures, since all methods of healing can provide examples of either.) Osteopathy, however, claims to be a method of healing which is suitable to the treatment of diseases of any description. In spite of the proposed insertion of clauses excluding osteopathy from the practice of "major surgery," midwifery, and anæsthetics, the principal witnesses supporting the Bill, when asked whether they would be willing to delimit the sphere of activities of osteopaths, made it abundantly clear that a claim to treat all diseases is made. It is in fact an alternative system of medicine for which statutory recognition was asked, a system for which there is no scheme of organised education in this country other than an establishment which was characterised in the report of the committee as "of negligible importance, inefficient for its purpose, and above all in thoroughly dishonest hands." The committee reached the conclusion that the claim of the osteopaths to be able to treat all diseases has not been established, and that it would not be safe or proper for Parliament to recognise osteopathic practitioners as qualified, on a similar footing to that of registered practitioners, to diagnose and treat all human complaints. They hold that the question of establishing a register of osteopathy by Act of Parliament should in any case be deferred until the sphere of osteopathy has been defined and a system of education in its principles and practice has been developed in this country in one or more well-equipped and properly conducted institutions.

The answer to the question raised in the course of the hearing as to whether there should be what was described as a "scientific inquiry into the merits and practice of osteopathy" is answered by implication in the reiterated conclusion that "the claim of the osteopaths to be able to treat all diseases has not been established." The recommendation that the Bill be not further proceeded with carries therefore finality which will, it may be hoped, be interpreted as precluding the necessity of expending public money on any further inquiry.

THE DETECTION OF DEFECTS IN SCHOOL-CHILDREN

IN the city of New York there are 635 elementary school buildings with about 760,000 children. For every 100,000 children there are approximately 2700 teachers, 40 school nurses, the equivalent of 7 whole-time medical officers, 2 dentists, and 3 dental hygienists. With the aid of a liberal grant from the Metropolitan Life Insurance Company and the coöperation of the city departments of education and health, the American Child Health Association has attempted to ascertain whether the best use is being made of this personnel to detect seriously diseased or defective children and to ensure that their defects are remedied.[1] The investigation was conducted over about 18 months, commencing in January, 1932—i.e., during the period of depression. Attention was concentrated on children about the middle of school life, and on a limited group of defects, viz., defective vision, dental decay, defective hearing, subnormal nutrition, enlarged tonsils, and pediculosis. "Health awareness," a measure of the effect of education in hygiene, was also tested.

The methods of investigation, the results and the conclusions reached, are set out in a report now issued; the methods resemble those which have been described in previous publications of the Association and in the writings of Dr. RAYMOND FRANZEN. Large groups of children in fair samples of the city's schools were examined for each type of defect by a selected team. The history of the seriously defective was then traced in relation to their contact with the health organisation and an attempt was made to trace the link in the chain where a breakdown, if any, had taken place—whether the teacher or the nurse had failed to detect abnormality, or the physician had misdiagnosed at routine inspection, or there had been failure to follow up, or inadequate explanation to the parent or neglect or incapability on the latter's part. A fairly large error of detection was found, especially on the side of deficiency as regards malnutrition and excess in tonsillar disease; a lack of standards caused the trivial defects to receive attention to the detriment of the more severe ones; there was an overburdening of the follow-up staff and inadequate understanding between the elements of the machine. Without increasing the annual budget, the whole organisation could clearly be made much more efficient. Dr. FRANZEN and his co-workers believe that their findings would probably be repeated if similar inquiries were made into the working of the service in many other towns; and they make constructive recommendations under each heading.

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[1] Physical Defects: the Pathway to Correction. American Child Health Association, New York, U.S.A. 1934. Pp. 171.

While the British system, with its whole-time officers working in small teams, is probably less prone to some of the errors recorded in this report, there are probably few areas where deficiencies of a like nature would not be found. The method of inquiry, described here in detail, might well be applied internally by chief school medical officers from time to time as a means of detecting flaws in their machine. In particular the mode of approaching the assessment of nutrition, by screening out the suspects with the help of the A.C.H. index, deserves wider trial in this country than it has so far received. This index, consisting of the ratio of the width of the hips to the difference between arm girth and chest depth, has been fully described by Dr. Franzen.[2] Probably few will agree that the selection of children for dental examination can be left to teachers and nurses, as the writers appear to contemplate. This is a branch of school medical work which must be specialised from the beginning at any cost. The report will repay study by all who are doing school medical work, the more so since the value of this service is being widely questioned even among those who are devoting their lives to it.

POST-MORTEM TECHNIQUE AND INTERPRETATION

Over a century has passed since it was first recognised that many physical signs and symptoms are dictated and can be explained by anatomical changes in organs. This fact plays an important part in the training of the student and is constantly being confirmed by the experience of clinicians who habitually visit the post-mortem room. It is a matter of history that it was the combination of careful study of patients in hospital with that of morbid anatomy that formed the basis of the achievements of such men as Hunter, Laennec, Bright, Addison, and Hodgkin, to name only a few. However, during the successive periods when bacteriology and biochemistry were first assuming clinical importance it became the fashion to contrast the so-called "pathology of the living" with the pathology of the dead, with some show of satisfaction that this last was obsolescent. The pendulum is swinging back with the advance as a scientific method of experimental pathology, for it is on the interpretation of the lesions obtained and their comparison with those produced by natural disease that much of the value of this method depends. The revival of interest in morbid anatomy has also been stimulated by the greater precision which has been brought to the diagnosis of structural abnormalities of the internal organs by X rays. This especially applies to the thoracic cavity, where the indications for and end-results of modern surgery and radiotherapy have not yet been fully explored. If there is a difference between the modern attitude to material removed at operation or from the dead subject and that of the morbid anatomists of the past, it is that the outlook now is dynamic rather than static, and it is always as a stage in a process of disease or repair that any abnormality is considered.

As Dr. W. G. Barnard well says in a pamphlet recently published[1] on the technique of a post-mortem examination, the object of such an examination should be to analyse the changes in each individual organ so as to arrive at a coherent account of the processes which have been active in the body. To enable the worker to do this an orthodox technique has become almost universal. The method advised by Barnard as "a guide to keen clinicians who themselves undertake post-mortem examinations," and written from the central histological laboratory of the L.C.C. at Archway Hospital, differs but little from that described by Dr. D. R. Coman[2] as practised in the pathological institute of McGill University; both are based on the classical work of Virchow. There is of course inevitably some variation in practice, as every skilled worker will have his own methods of choice. For instance, Coman gives the removal of the thoracic organs in toto only as an alternative technique, whereas it is the routine most usually practised in the London teaching hospitals. Such variations have little disadvantage provided the dictum of Orth is remembered: "the chief requisite of every exact post-mortem examination is that no part shall be displaced from its position until its surrounding parts are established, and that no part shall be taken out by the removal of which the further examination of other parts is affected." Barnard heads his description by the wise warning "The most important rule of all is: Look before you cut and do not cut unless you can see what you are doing." For workers less skilled it might be well to add—do not cut unless you know *what* you are cutting. Barnard's description is short, concise, and adequate and deals only with technique, a brief paragraph being given on examinations for coroners. It seems curious that all reference to special precautions in cases of accident, suicide, or suspected poison should be omitted in Coman's much bigger handbook. In other respects this book gives all essential details, and with the clear diagrams supplied should enable any practitioner of average knowledge to go through the motions of a thorough post-mortem without disgrace.

There remains, however, the question whether he can interpret the material displayed. There is in many quarters a view that this is mostly a simple matter—a view that is not shared by experienced pathologists. The East Ham insurance committee recently circularised all such committees in England and Wales on the subject of the arrangements made by coroners for post-mortem examinations. Apparently it is now the policy of the coroner for that area to employ one particular pathologist for all these examinations, whereas in the past, apart from exceptional criminal cases, it was customary to call on the general practitioner attending the case either to perform the examination or at least to be present thereat. The committee concerned expressed the pessimistic view that the post-mortem room is the one place where doctors learn the truth, and that attendance at post mortems provides "valuable opportunities for general practitioners to further their experience of pathology and, in the case of their own patients, often affords them facilities for corroboration in the very real problem of diagnosis." The response to the circular shows that in the main insurance committees are disinclined to accept the suggestion that in normal cases the patient's medical attendant, or the practitioner called to the case, should be selected to perform the post-mortem examination, and that in cases deemed to require the services of an expert pathologist the general practitioner should be invited to be present. Of the panel committees some have decided to support the proposal, while others agree that the practitioner should have the opportunity to attend every such examination while not subscribing to the view that he should necessarily be called upon to perform it. In reply to a question in the House on this matter the Home Secretary pointed out recently that since the passing of the Coroners (Amendment) Act, 1926, it has been open to a coroner to request any legally qualified medical practitioner to make a post-mortem examination and that he has no power to interfere with this discretion.

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[2] Amer. Jour. of Dis. Child., 1934, xlvii., 789.

[1] Technique of a Post-mortem Examination. By W. G. Barnard, M.R.C.P., M.R.C.S. London County Council. 1935. No. 3121. Pp. 7. 2*d*.

[2] Technique of Post-mortem Examination. Compiled by D. R. Coman, M.D., C.M. Montreal: Renouf Publishing Company. Pp. 47. 6*s*. 6*d*.

In a memorandum of evidence to the Departmental Committee on Coroners' Law and Practice now sitting, the British Medical Association notes [3] that coroners are increasingly availing themselves of the provisions of Section 22 of the 1926 Act, under which they can call in specially qualified persons to make post-mortem or other examinations, and the Association makes no suggestion for restricting their freedom of choice in this respect. But it feels that the position of the practitioner who was in attendance prior to death is not fully safeguarded by existing provisions and proposes that (*a*) if he has not been asked to perform a post-mortem he should be given an opportunity of being present, no fee being paid for such attendance; and (*b*) the coroner should have discretionary power to invite the practitioner to be present if he has not been asked to perform the post-mortem and that the statutory fee of one guinea should be paid in such cases. We have every sympathy with the desire of the practitioner to follow his fatal cases to the post-mortem room, but at the same time it is clearly desirable that autopsy should be performed by people who are specially qualified by training and experience for this work. A compromise on the lines suggested by the B.M.A. appears to meet the situation. The educational value of a post-mortem to which the East Ham insurance committee draws attention will be far greater to the practitioner who watches it performed and demonstrated by a pathologist than to one who attempts unaided to solve problems whose wider significance can only be recognised by an expert.

THE PHYSIQUE OF MAN IN INDUSTRY

THE golden age is always in the past and we can read, almost daily, that the present generation is inferior to its predecessors either physically, mentally or morally—or, indeed, in every way. But the sceptic can remain unmoved by this indictment, and point with justice to the absence of well-founded standards by which we can measure the deterioration alleged. General impressions are apt on occasions to be surprisingly misleading, and with regard to physique the desideratum must be a large and representative body of anthropometric data. The lack of such material in this country was pointed out many years ago by the Interdepartmental Committee appointed after the Boer war to inquire into physical deterioration. They could find no satisfactory evidence to support the belief in a general progressive deterioration, but they carefully underlined the fact that no sufficient material was available for a comparison of the physique of the nation with its status in the past. So far as an anthropometric survey was concerned, however, their report led to no action. Interest was once more widely awakened with the publication of the famous "C 3" report, but as this related to men examined in the last year of the late war, it was rightly held that such a sample could not possibly be taken as representative of the manhood of the country.

This absence of representative data forms one of the reasons which has led the Industrial Health Research Board to initiate a wide and careful investigation into the physique of men in industry, a report upon which has now been issued.[1] The work has been directed by Prof. E. P. CATHCART, F.R.S., and all the measurements were made by two workers, Mr. D. E. R. HUGHES and Mr. J. G. CHALMERS. Between them they have recorded the height, weight, strength of grip, strength of lift or pull, and distance of middle finger tip from the ground of 13,656 individuals—10,593 employed men, 1328 unemployed, and 1735 university undergraduates, drawn from nearly all parts of the country and industries. The very detailed statistical analysis to which this material has been subjected reveals some curious results. For instance, the maximum height seems to be reached at about 20–21 years of age, and after about the age of 25 there is a gradual and fairly steady decline. Is this due, as the report suggests, to the development of a less erect carriage with advancing years, or to an absence of a proportion of the most physically fit at higher ages due to casualties in the war; or is it evidence of greater height in young adults such as has certainly been demonstrated in school children? The unemployed men were found, on the whole, to be a little inferior in weight, and in the tests of strength definitely inferior to their employed brethren. These men had been continuously unemployed for six months and more, and the question arises whether their reduction in strength is a consequence of their enforced idleness or whether they represent the unemployable—the last to be employed when work is abundant, and the first to be discharged when work is scarce. The authors of the report conclude that the sample measured by them is drawn from the latter class and is, therefore, unrepresentative of all the unemployed.

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[3] Brit. Med. Jour., Supp., June 22nd, 1935, p. 282.

[1] Industrial Health Research Board. Report No. 71: "The Physique of Man in Industry." London: H.M. Stationery Office. 1935. Pp. 42. 1s. 3*d.*

The most striking characteristic of the measurements when divided into occupational groups is the uniform superiority in height of the "black-coated" group. In tests of strength, on the other hand, they did not excel and their strength of pull was definitely inferior to that of men in manual occupations. Geographically, London men are in their average height and weight definitely above the employed group as a whole—perhaps the result of selective migration of the more physically fit from the country districts. In spite of their extent, the data are not sufficient to determine how far heavy industries attract men of superior physique, or to what extent mechanisation has equalised the demand for brawn and muscle, and no satisfactory index of physical fitness has been evolved from them. But these sample figures are likely to prove the first approximation to the standard we need to determine whether the physique of entries to industry is being maintained, improved, or is deteriorating. In their collection Prof. CATHCART and his associates seem to have been granted willing assistance by the employers approached, and it is satisfactory to note (as evidence opposed to national deterioration mentally) that they are spared the explanation of failures given by Dr. BEDDOES, engaged on the same quest in 1870—namely "in Scotland to greed of time or to superstition; in Ireland to carelessness or to political feeling; in Wales to suspiciousness; and in England to stupidity"!

ANNOTATIONS

MILK PROCESSING AND CONTROL

IF civilisation may be defined as the conscious pursuit of quality, the City and Guilds of London Institute, in collaboration with representatives of the dairy industry and assisted by a strong advisory committee, have taken a notably civilised step in devising and issuing syllabuses for examinations in "Milk Processing and Control."[1] There can be no doubt that if their action is adequately supported by the dairy industry, there will be in course of time a steady increase in the competence and number of technical men now urgently needed for the effective operation and control of processing and manufacturing plant in all branches of the milk industry, and an accompanying improvement in the general standard of quality of our processed milk and manufactured milk products.

The syllabus and regulations embrace two examinations (i) one of "intermediate" grade for which a preparation period of five hours per week in a technical institution during the winter sessions of each of two years—i.e., some 200 hours altogether of lectures and practical instruction—is suggested as reasonable, and for which the syllabus includes some elementary chemistry, elementary physics and simple microbiology, and (ii) a final examination, open to those who have passed the intermediate examination, in (*a*) milk processing and milk products manufacture (pasteurisation, sterilisation, ice cream, condensed and dried milk products) and/or (*b*) the chemical and bacteriological control of milk and milk products, in the latter case clearly intended for those who are to work in fairly responsible technical positions in dairy industrial laboratories, or in laboratories outside the industry dealing with the control of milk and milk products. For the final examination, either (*a*) or (*b*), a period of study covering a further period of two years is suggested as advisable. The British Dairy Farmers' Association, in conjunction with the University of Reading, have had satisfactory courses of instruction in dairy running for some time, but the processing and manufacturing industry has been without similar provision for technical education. It is clearly to the advantage of all concerned—to the milk producer, to the distributor or manufacturer, to the consumer, and to the individual himself—that any person who is in charge, say, of a pasteurisation plant or an ice-cream plant shall have had at some time a reasonable training in the elements of science as applied to what is, nowadays, a highly technical job. The costly and complex plant used to-day, requires and demands knowledge and technical ability in increasing measure as its capacity and complication increases, and these are required not only for the laboratory control of the product at every stage but for the proper running and economical maintenance of the plant itself. In pasteurisation, for example, a process of first importance from the public health standpoint, it is impossible not to realise that, with some outstanding exceptions, the level of technical knowledge and ability displayed by the men in technical charge of the plant has little relationship to the high quality of the plant itself or to the amount of capital invested in it. As a result, the word "pasteurised" on the bottle of milk in the consumer's hands is in too many cases grossly misleading, as was clearly brought out in our columns recently by Prof. H. D. Kay, and Mr. F. K. Neave.[2]

THE ANATOMY OF THE HAND

STUDIES in the anatomy of the hand and its relation to infections have recently been undertaken by a group of workers in the University of Lille. Prof. Cordier, with the help of M. Coulouma, has made careful dissections of the hand, supplemented by injections of plaster, barium, and lipiodol, and subsequent radiography.[3] [4] He has come to the conclusion that in the upper part of the palm of the hand is to be found a compartment corresponding to each finger. The thenar space corresponds to the thumb, and its medial limit is more usually the second metacarpal than the third. Each digit is represented by a space, that of the index being well separated from the others. In the case of the other digits septa run forwards and backwards from the tendons, thus creating pre- and retro-tendinous compartments. The septum running back to the third metacarpal is especially constant. In the lower part of the palm have been found two channels; one for the lumbrical muscle and one for the tendons. In the case of the thumb the adductor carries a sheath and thus acts in much the same way as a lumbrical muscle. Thus each finger may communicate with its own palmar compartment, whilst the little finger communicates also with the hypothenar space and the thumb communicates with the thenar space and with the compartment for the index. The compartments for the index and middle fingers communicate with the thenar space via the branches of the median nerve. The practical application of this work is to emphasise once again the necessity for early operation in infections of the fingers tending to track towards the palm, so that the correct incision may be made before the pus has ruptured from one compartment into another. The incisions for opening up the lumbrical canal and the tendon sheath correspond with those recommended by A. B. Kanavel.[5]

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[1] Pamphlet 87, obtainable from the Superintendent, Department of Technology, City and Guilds of London Institute.

[2] THE LANCET, June 29th, 1935, p. 1516.

[3] L'Echo Médical du Nord, 1934, i., pp. 513 and 545.

[4] Revue de Chirurgie, 1934, liii., 563.

SOME ASPECTS OF GLAUCOMA

THIS is the title of a lecture recently given by Mr. R. Affleck Greeves.[6] Many years ago Mr. Treacher Collins demonstrated structures in the ciliary body resembling glands, and suggested that they actually do secrete the fluid known as the aqueous humour. This theory has never been generally admitted, and of late years has gone very much out of favour. Mr. Greeves writes: "The points of similarity in structure between the ciliary processes and the choroid plexus of the brain are, in my opinion, strongly suggestive of a similarity in function, and therefore of a probable secretory element in the fluid production in the eye." Most modern authorities hold that the aqueous is not a secretion but a dialysate, and that the part played by its circulation and the integrity of its channels of egress in the pathology of glaucoma is comparatively slight. Mr. Greeves considers, on the other hand, that the time-honoured custom of laying the blame for abnormally raised tension on the non-functioning of these channels is fully justified. On the question of diagnosis his attitude is also conservative, but he confesses that he is himself old-fashioned enough to put more trust in the trained digital sense of the expert ophthalmic surgeon, coupled with accurate fundus and field examination than in any tonometer. The fact of abnormally high tension being established, the difficulty remains of determining whether the glaucoma is primary or secondary. The presence of keratitis punctata establishes the diagnosis at once, but often, in the presence of a glaucomatous haze of the cornea, it is impossible to be sure whether or not it is actually there. The point is of vital importance because in primary glaucoma the first essential in treatment is to insert a miotic; in glaucoma, secondary to iridocyclitis, such treatment will probably make matters worse and a mydriatic may be indicated. The depth of the anterior chamber is a most important point in diagnosis, but a shallow chamber is not enough by itself to determine that the glaucoma is primary. Mr. Greeves expresses the view that some of the cases of congestive glaucoma with shallow chamber may be a mixture of primary and secondary glaucoma. In deciding on the treatment of such a case, the depth of the anterior chamber is of primary importance; if it is deep a mydriatic may be used with benefit and impunity, but if it is shallow, shallow miotic treatment is indicated.

Many other aspects of the glaucoma problem are discussed in this interesting lecture. Mr. Greeves divides primary glaucoma into two main groups: the first comprising cases of acute, subacute, and chronic subacute glaucoma, with either pain, rainbow haloes, or misty vision; the second includes chronic simple cases with no subjective symptoms beyond gradual failure of vision and field, the patient being often unaware that the vision of one eye is gone until the other begins to go. In the first, or congestive group, a strenuous attempt should always be made to reduce the tension by treatment before an operation is undertaken; the prognosis after operation as regards visual acuity, he says, is infinitely better "if one has succeeded in reducing the tension beforehand than if one is forced to operate on a congested hard eye, quite apart from the danger of convulsive hæmorrhage." The details of treatment, both non-operative and operative, set out by Mr. Greeves, are well worth study, as is also the section on diagnosis by field and disc examination of cases of simple chronic glaucoma, in some of which even raised tension may be absent at the actual times when the consultation takes place. His comments on the causation and pathology of these cases are original and important. He believes firmly that the true explanation of simple glaucoma is failure in function on the part of the filtration angle of the anterior chamber, and in this connexion recalls an observation of Mr. Thomson Henderson's that the fibres that lie between the root of the iris and Schlemm's canal normally undergo a thickening as age advances, thus tending to obstruct the channel through which the aqueous finds a normal exit, and so predisposing to glaucoma during advancing age. The weak point of Henderson's theory appears to be that if it were true presbyopes should be much more subject to glaucoma than they are in practice. Mr. Greeves supplements the theory by the suggestion that in some people a congenital anomaly may cause these fibres to be unusually tough, or that the process of thickening may be abnormally hastened during the presbyopic period.

To the older men who learnt ophthalmology at Moorfields it will thus bring some satisfaction to learn on the authority of a well-known member of the present staff that the teaching that they received in their student days on glaucoma is not yet entirely superseded.

STUDIES IN HAY-FEVER

SEVEN original articles on hay-fever are to be found in *Nordisk Medicinsk Tidskrift* for June 1st. The first of them, properly enough, is a historical retrospect and an Englishman enjoys pride of place in it. But since Bostock presented his report on hay-fever to the Medical and Chirurgical Society in London in 1819 much has been learnt of this disease, and it is now remarkably amenable to specific treatment provided doctor and patient exercise foresight and patience. This is, at any rate, the opinion of Prof. K. Hansen, of Lübeck. He claims that with prophylactic subcutaneous injections of pollen antigens he has succeeded in curing or relieving over 90 per cent. of the 961 patients treated in 1932 and 1933. During the past four years he has used a mixed standard preparation containing extracts of all the pollens found to be pathogenic in Central Europe; and though he deplores his departure from the narrow road of strictly specific treatment—according to which he should inject only that antigen which skin tests have convicted for the particular case—he has found material considerations an irresistible inducement to the use of polyvalent mixtures. Only when these fail does he recommend a special search for some rare pollen antigen as a cause of hay-fever. The journal also contains a study by Dr. P. Vallery-Radot and Dr. G. Mauric, whose work in Paris on asthma and hay-fever has centred on their reactions to artificial fever. Their thesis, which they support with details of an illustrative case, is that above a certain thermal threshold asthma and hay-fever can be aborted by fever, and that immunity to offending pollens can be acquired if, during an attack of artificial fever, the patient is made to inhale such pollens in large quantities. The preparation with which they have induced fever is a 1 per cent. solution of sulphur in oil, 2 c.cm. of which is given by intramuscular injection. In the case in question immunity to hay-fever was promptly acquired by this measure, the patient remaining free from oculo-nasal symptoms for the rest of the summer. In another paper, Dr. K. H. Baagöe of Denmark refers to his experience with 52 cases of hay-fever, and to the effects of prophylactic injections of an extract of pollen given twice a week for two months before the hay-fever was due. Considerable benefit was obtained in 14 cases, and none in 6. Dr. Arno Saxén of Helsingfors draws attention to the remarkable rarity of severe hay-fever among his compatriots in Finland, but is able to suggest no explanation of it.

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[5] Infections of the Hand. London, 1934.

[6] Irish Journal of Medical Science, June, 1935, p. 241.

LEAGUE OF NATIONS AND NARCOTIC DRUGS

THE advisory committee on traffic in opium, at its twentieth session under the chairmanship of Dr. Carrière, the representative of Switzerland, reviewed the present situation in regard to the international traffic in dangerous drugs. While it is claimed that the licit production of narcotics now approximates to the legitimate requirements of the world, illicit traffic has not diminished and clandestine manufacture is going on both in the West and in the East. More drastic measures, such as the appointment of special police to track down clandestine factories, the infliction of heavier penalties for traffickers, and better international coöperation were considered and referred to the Secretariat for report to the next meeting. It appears that only three countries of Latin America have this year furnished reports required under the conventions. The Limitation Convention of 1931 has now been ratified by 53 governments, recent signatories being New Zealand, Japan, Panama, and Ecuador. As regards China, Mr. Hoo Chai Tsai reported new regulations adopted in April, 1935, whose Draconian severity appears to have shocked some of the delegates. There is to be compulsory treatment for drug addicts; if in 1936 there are any remaining untreated they will be imprisoned for five years and undergo the compulsory cure. After 1937 the penalty for the non-medical use of narcotic drugs will be death or imprisonment for life. The use of opium prepared for smoking is to cease by 1938. It was reported that more than 597 special hospitals for smokers and addicts had been established by the government in China; and it was claimed that no fewer than 81,344 cures had been already effected. Poppy cultivation is to be prohibited in some provinces and reduced in others until, in six years' time, it is hoped that it will be completely abolished. Those who recall the previous efforts in this direction some seventeen years ago, and the subsequent regrettable reversion to the extensive cultivation of the poppy, may regard these anticipations as over sanguine, while recognising the good intentions of General Chiang Kai Shek and the Chinese Government. Meanwhile the Japanese Government has authorised Dr. Somei To to report on 150,000 opium smokers in Formosa and the mortality and criminality of such addicts. The statistical results are receiving the attention of the advisory committee.

The Permanent Central Opium Board also met in Geneva last month, under Mr. Lyall's chairmanship, and discussed the legal position created by the production of morphine from "poppy straw." They invited the views of the advisory committee on the new situation which has thus arisen.

RADIOLOGICAL DIAGNOSIS IN THE ACUTE ABDOMEN

Dr. Irving W. Ponemon,[1] of Jamaica, is convinced of the importance of X ray examination in the differential diagnosis of the acute abdomen. He contends that its use is an additional safeguard against such serious errors as the performance of laparotomy for the abdominal pain which accompanies the onset of some cases of pneumonia; delay in opening the abdomen in the less typical cases of intestinal obstruction or perforation of ulcers; and confusion of the generalised pain of coronary thrombosis with that of perforation of a viscus. He cites examples where radiology has been of definite value. The histories of two children are contrasted, each aged five years. The onset of illness in both was with a cold, abdominal pain and vomiting appearing four or five days later; both children were found to have abdominal rigidity, and no signs in the chest were discovered in either. In one child the X ray showed evidence of commencing consolidation at the right base, while in the other child it was negative. The second child was submitted to operation when perforation of an inflamed appendix, with peritonitis, was found; the first child recovered from its pneumonia. In another case, quoted by Ponemon, radiology disclosed an unsuspected subphrenic abscess as a complication of cholecystitis and calculus, thus materially affecting the operative procedure. The localisation and appearance of distended coils of intestine can give valuable information. In one instance, distended coils in the lower right quadrant of the abdomen clinched a rather uncertain diagnosis of appendicitis. Gaseous distension with fluid levels underlying the collections of gas provides a sign almost pathognomonic of intestinal obstruction; but Ponemon believes that it is possible to detect in an X ray the evidence of a localised distension of a *single* loop in the early stages of an obstruction, thus giving the patient the chance of early operation. The appearance of a collection of gas under the dome of the diaphragm is, of course, a most useful piece of evidence in the detection of a gastric or duodenal perforation; especially in a case seen either during the stage of reaction (when all pain may temporarily disappear) or when, as a rare occurrence, the perforation has sealed over, leaving the diagnosis resting on a rather indefinite history. Where the possibility of coronary thrombosis is under consideration in the differential diagnosis of perforation, the importance of the demonstration of the presence of free gas in the abdominal cavity is obvious.

The main drawback to the use of radiology in these acute illnesses is the extra strain it puts on the patient. An X ray in the supine position is almost always possible, but for the detection of fluid levels and for the examination of the diaphragm the upright position is usually necessary, and experience shows that this may involve considerable difficulty. Ponemon considers the sitting position satisfactory; but this may give a very imperfect picture of the abdominal cavity, as the plate has to balance on the patient's lap. In most cases the disadvantages of submitting the patient to the strain of a radiological examination may outweigh the advantages, but the possibility that such an examination may clinch a difficult diagnosis should be remembered.

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[1] Amer. Jour. Surg., 1935, xxviii., 122.

COLOUR VISION

An important contribution to the study of colour and colour vision has just been published by the Medical Research Council.[1] The abundant literature on this subject mostly deals with qualitative investigations and results; in this research by Mr. F. H. G. Pitt, which represents a continuation of the work of Mr. L. C. Martin, D.Sc., and Mr. W. D. Wright, Ph.D., at the Imperial College of Science and Technology, it is the quantitative factor which has been particularly studied, with fruitful results. The apparatus used was a slightly modified form of the Wright colorimeter—an apparatus of a high degree of accuracy, designed by Dr. Wright and used by him in his redetermination of the trichromatic mixture data,[2] and the object was to determine the colour coefficient, luminosity, and hue discrimination data for dichromatic observers and to compare them with those for normal observers.

In the first investigation the red and blue primaries were used for deuteranopes, and the blue and green for protanopes, the data of these latter being transformed for comparative purposes so that the coefficients were referred to blue and red primaries; this was deemed necessary owing to the low degree of protanopic luminosity at $0{\cdot}65\,\mu$. The colour standard was a spectral colour at $\alpha = 0{\cdot}494\,\mu$, the units being so chosen that the colour had equal amounts of each primary. The energy source was a standardised 1000 watt gas-filled lamp, the modified beam being reflected into the field from a white magnesium oxide screen. The eyes of the observers were dark-adapted before experimentation and each match was repeated three times.

The two main curves for the protanopic and deuteranopic groups are very similar, the only difference appearing from about $0{\cdot}51\,\mu$ to the red end of the spectrum. It was found that the blue coefficient for the standard white is greater for the protanope than for the deuteranope; and by deduction, that all colours possible to dichromatic vision can be seen by dichromats in the spectrum. In the determination of luminosity data measurement was made of the luminosity curve of the ordinary spectrum, and of the spectral energy distribution; and the luminosity curve for an equal-energy spectrum was calculated. For the first investigation a flicker photometer was used with light from the blue primary only, flicker being eliminated by means of a neutral wedge. The separation of protanopes and deuteranopes by this means was quite distinct, overlap of even the extremes of each group not occurring except from $0{\cdot}48\,\mu$ to the violet end. For the complete calculations and results of the remainder of this part of the investigation reference must be made to the report.

The measurement of hue discrimination curves was based on experiments in which by slow movement of the test colour prism in each direction the two halves of the field were made just perceptibly different; half the difference beteween the readings gave one colour step, allowance being made for variation in the length of the steps throughout the spectrum. It was found that the curves of six deuteranopes formed a well ordered set, whereas the protanopic curves were not so consistent; the mean curve for this group does not therefore represent the average so accurately as does that for the other group. The conclusions reached were that the discrimination of the deuteranope and the normal trichromat is approximately the same in the blue-green, and that the discrimination of the protanope is not so good as that of the deuteranope, nor is his range of discriminable colour so large.

In the remaining sections of the report consideration is given to saturation, qualitative tests, the work of previous observers and the theoretical considerations in connexion with colour vision, together with the bearing of the present dichromatic measurements on these theories. From a consideration of colour triangles the conclusion is reached that deuteranopes can distinguish only 15 colours, and protanopes 12, when the intensity is uniform, the corresponding figure for a normal trichromat being 43. Moreover, if 500 trichromatic colours were included the number for the dichromat would only increase very slightly. In an appendix Mr. Pitt records the results of an investigation of anomalous trichromats (those whose colour system is a function of three variables but whose matches differ from the normal). The investigation was done on green anomalies only, and no definite conclusions are drawn. Another appendix, by Dr. Wright, is concerned with the advisability of regarding the eye of the normal and colour-blind observer as two entirely unrelated pieces of apparatus, and with the position of the anomalous trichromat relative to the normal trichromat and the dichromat.

The value of the information here set out is, as Dr. Wright says, twofold. It enables us to determine exactly by how much one colour will differ from another, and understand the extent to which colours that appear distinct to the normal eye will be confused by the so-called colour-blind eye; and it also provides us with further material on which to develop a theory of colour vision and colour blindness.

NUTRITION AND LEPROSY

The fact that *Bacillus* (or *Mycobacterium*) *lepræ* does not fulfil Koch's postulates has at times given rise to much discussion of its ætiological significance. Few will now be found to dispute its claim to be the cause of the disease, but clearly there are many other factors which play an important part. It is almost an axiom that the healthy adult does not acquire leprosy unless he comes into close and very prolonged contact with the disease, and if he does his resistance probably has to be lowered before dissemination of the organism is clinically manifest; but the same rule does not apply to children and adolescents, because there seems to be an added susceptibility during the growing periods of life, when metabolic activity is at its height. How far the risk is affected by diet is a question that has long been debated. Sir Jonathan Hutchinson, it will be remembered, laid the whole responsibility on putrid or badly cured fish; he said that "the fundamental cause in the malady known as true leprosy is the eating of fish in a state of commencing decomposition."[1] Like many others which contain an element of truth, this theory was widely quoted, and since Hutchinson's time workers have constantly laid stress on the need for a proper diet. A recent observation by Atkey[2] is that the milk-drinkers of the Sudan have very little leprosy. Again, it is known that the incidence of leprosy is much higher in South Korea, where the diet consists chiefly of carbohydrates, than in North Korea. It is the lack of a balanced diet, with associated vitamin deficiency, that appears to be of greatest detriment, and it is interesting to note that, other things being equal, there is usually a high incidence of leprosy among people who subsist on a diet containing excess of carbohydrate—e.g., the cassava-eating people of the southern Sudan. Recently Lee[3] has drawn attention to a reduction of gastric acidity in leprosy, pointing out that the more severe and long-standing the skin lesions, the more definite the hypochlorhydria. It must be borne in mind, however, that leprosy, especially the cutaneous variety, is a systemic disease and that where the skin is involved the bacilli have invaded the whole reticulo-endothelial system, producing lowered resistance of the whole organism. This process must lead to more or less cachexia, and it seems probable that Lee's findings could be explained as due to general decline in bodily functions, and that low acidity should not be invoked as a cause of the nutritional failure which encourages infection by the leprosy bacillus. If light could be thrown on the reasons for the dissemination of the bacilli through the body, it might be possible to raise the resistance of the patient appropriately and so check the progress of the disease. Meanwhile it can hardly be doubted that an adequately balanced diet with suitable content of vitamins does much to improve the chance of recovery.

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[1] Characteristics of Dichromatic Vision (Report XIV. of the Committee upon the Physiology of Vision). By F. H. G. Pitt. Medical Research Council, Special Report Series No. 200. 1935. Pp. 58. 1*s.* 3*d.*

[2] Medical Research Council, Special Report Series No. 139, 1929.

DR. JOSEPH HUNTER, M.P.

WE regret to learn of the death, on Tuesday last, in Charing Cross Hospital, of Dr. Joseph Hunter, the well-known Liberal M.P. for Dumfriesshire. Dr. Hunter was that admirable type of medical Member of Parliament who had seen the working of medicine reflected on general society in numerous official capacities. He graduated in medicine at Edinburgh in 1898 and became resident physician at the Royal Infirmary, Edinburgh, when he joined the South African Field Force as a civil surgeon, gaining the Queen's medal with clasps, and showing himself a highly competent officer. Thereafter he took the diploma of D.P.H., and served as medical officer of health and police surgeon to the borough of Dumfries, and was also physician to the Dumfries and Galloway Royal Infirmary. After 20 years of official medical work he entered Parliament as the Liberal Member for Dumfriesshire in 1929, displacing with a great majority the sitting Conservative Member. At the next General Election he held his seat against a Liberal opponent, and this time with a very large majority, a clear example of the recognition by a large community of the value of his local services, and of the ability with which he fulfilled his responsibilities. In 1929 he became the Scottish Liberal Whip, and in 1934 was appointed organiser of the Liberal National Party. Dr. Hunter will be deeply missed from the circle of politics where he played so prominent a part as well as by many friends and colleagues.

THE NEUROLOGICAL CONGRESS

ON Monday next the second International Neurological Congress opens in London under the presidency of Dr. Gordon Holmes, F.R.S. Sir Charles Sherrington had been elected at last year's preliminary conference, but was unable to undertake the arduous duties on grounds of health. The congress sits in the large hall of University College, Gower-street, from Monday to Friday, the morning sessions being devoted to set discussion of four main topics: (1) Monday (morning and afternoon)—The epilepsies, their ætiology, pathogenesis and treatment (chairmen, Prof. O. Marburg and Prof. O. Rossi). (2) Tuesday—The physiology and pathology of the cerebro-spinal fluid (chairman, Prof. O. Foerster). (3) Thursday—The functions of the frontal lobes (chairman, Prof. H. Claude). (4) Friday—The hypothalamus and the central representation of the autonomic system (chairman, Prof. B. Brouwer).

At the three afternoon sessions, which will sit in seven groups, nearly 300 papers will be presented. On Wednesday evening at 9 Prof. Foerster will give the triennial Hughlings Jackson memorial lecture (on the Motor Cortex in Man in the Light of Hughlings Jackson's Doctrines) under the auspices of the section of neurology, Royal Society of Medicine, and this section will hold a reception later in the evening. Other receptions will be held by the Ministry of Health and the presidents of the Royal Colleges. The official banquet is on Thursday evening at Grosvenor House. Wednesday has been left free. The secretary-general of the congress is Dr. Kinnier Wilson.

THE Princess Royal has appointed Dr. L. F. R. Knuthsen, C.V.O., to be her physician-in-ordinary.

THE death is announced of Mr. Arthur Shillitoe, F.R.C.S. Eng., a well-known authority on syphilis.

THE peerage conferred upon Sir Hilton Young in the Birthday Honours is gazetted under the title of Baron Kennet, of the Dene, in the county of Wiltshire.

NEW SUSSEX HOSPITAL FOR WOMEN AND CHILDREN.—The latest addition to this hospital, which was the first in the country to be entirely officered by women doctors, is a nurses' home which is being erected in the grounds on the west side, and it is hoped that the completed building will be opened in November. The foundation stone was laid on July 18th by Miss Louisa Martindale, who said that it was an unusual task for a member of the honorary medical staff but she accepted it as a mark of appreciation of the hospital's medical and surgical work and of honour to her mother, the founder of the hospital. Her mother realised the demand there was in Sussex for a hospital in which women patients could be treated by members of their own sex, and foresaw how long they would have to wait if they were to depend upon the existing hospitals appointing women to their staffs. The hospital is open to professional and other women of small means who are unable to pay the expensive fees of a nursing home.

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[1] Hutchinson, J.: Leprosy and Fish Eating. London, 1906, preface, p. v.

[2] Atkey, O. F. H.: Internat. Jour. Leprosy, 1934, ii., 193.

[3] Lee, H. S.: Jap. Jour. Dermat. and Urol. (English abstr.), 1935, xxxvii., 88.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXII.—PROGNOSIS IN HEART-BLOCK

HEART-BLOCK is the term used to indicate a disorder of the function of the heart, notably imperfect conduction of the impulse. The term includes several types of disturbed function of varying degrees of severity, occurring in different sites.

From the point of view of prognosis one can exclude *sinu-auricular block*, which is extrinsic in origin, being due to depression of the formation of impulses at the sinu-auricular node by an increased vagal tone. Thereby the rate of the heart may be halved; but there is no prognostic significance to be attached to this aberration, which is wholly nervous in origin, and not indicative of myocardial disease. *Intra-auricular* block is not recognisable clinically. There remain: (1) *Auriculo-ventricular block*—(*a*) partial, with or without dropped beats; (*b*) complete heart-block. (2) *Intraventricular block.*

IMPORTANT FACTORS

The prognosis of heart-block in general must be considered with two points in mind: (1) the functional efficiency of the heart in which the lesions are found; (2) the liability for auriculo-ventricular block to be associated with syncopal attacks (Adams-Stokes). Many patients die from heart failure without developing heart-block at all; and some patients live for years with heart-block, and finally die from some condition that has nothing to do with the heart. Heart-block may be due to some local lesion; it may only be evidence of inefficiency in one small part of the heart, and this particularly applies to auriculo-ventricular block. On the other hand, the local lesion may be a part of general myocardial disease. In the assessment of prognosis, the efficiency of the heart as a whole in its response or lack of response to extra demands made upon it is the real ground upon which the prognosis must be based. It is necessary to emphasise the fact that the search for one particular prognostic sign may easily lead to fallacy. Heart-block when present must be fitted into the clinical picture and not singled out for too much attention. Its importance varies to some extent with its ætiology, in so far as this may have a bearing upon the presence or absence of general myocardial disease.

Partial heart-block without dropped beats can only be recognised with certainty by graphic methods. Dropped beats may usually be detected by auscultation, except when the rate of the heart is fast, and the varying degrees of delay in auriculo-ventricular conduction, together with numerous dropped beats, may make diagnosis difficult owing to the very irregular rhythm produced. Partial heart-block does not in itself affect the efficiency of the heart unless many beats are being dropped, when syncopal attacks may occur. In toxic conditions, such as diphtheria and rheumatism, it will probably clear up as the cause disappears. When syphilis is the cause the prognosis is apt to be influenced by the grave effects that accompanying aortic lesions may produce. In such cases there is considerable liability for higher grades of block to be set up, and Adams-Stokes disease (see below) may supervene. In elderly people, where arterial disease is almost always the cause, the degree of block may remain unchanged for years. But in some cases there is a tendency for the block to increase as the disease progresses. When auricular fibrillation is present, a certain amount of auriculo-ventricular block may be an advantage, for it will keep the ventricular rate slow without the use of digitalis.

Complete heart-block is usually easy to recognise clinically, especially if the patient's heart-rate be tested by injection of atropine, or if he can be exercised. The failure to respond by marked increase in rate is pathognomonic. Complete heart-block is not always associated with gross incapacity, and does not necessarily carry a bad prognosis, especially if Adams-Stokes attacks are absent. In some cases the rate, which may vary between 30 and 55 beats per minute, is not very slow, and is compatible with a fair degree of efficiency. Some patients live for years if no other signs of defect develop. In most cases, however, there is also widespread disease which causes heart failure.

Congenital complete heart-block is a rarity, and is usually associated with patency of the interventricular septum. The rate of the ventricles is usually faster than in the acquired lesion. Provided the septal defect does not affect the function of the heart unduly, those patients are often able to be fairly active and grow up to adult life. As is the case with all congenital lesions, secondary infections at the site are apt to occur.

Intraventricular block, which means delay or block in one or other of the two branches of the bundle of His, or delay in the spread of the impulse over the Purkinje system, can only be demonstrated by an electrocardiogram. Intraventricular block when present as bundle-branch block does not necessarily indicate anything but a local lesion. But mostly there is widespread disease as well. The efficiency of the heart is not affected by the local lesion in the branch of the bundle itself. Some patients survive and even lead an active life for years, but on the whole the association of myocardial disease with intraventricular block is not propitious, and those who show signs of heart failure only last a year or two. The same outlook applies to the type of curve denoting intraventricular block in the Purkinje system. Here again the majority of patients are suffering from gross lesions with more or less impaired efficiency. For the most part failure is likely to occur soon, and when it shows itself a short span of life is all that can be expected.

THE ADAMS-STOKES SYNDROME

The sudden loss of consciousness characteristic of Adams-Stokes attacks may manifest itself when first the obstruction in the bundle of His is complete, and there may be a pause before the ventricles beat with their own slow rhythm; again, when the block has already been present for some time, interference with the activity of the new pacemaker may cause extreme slowing or standstill. These attacks are dangerous for two reasons. The standstill may lead to sudden death, or the fall, without warning, in some dangerous place or in traffic, may give rise to serious injury. But the liability to these attacks may be transient, and once the patient is free from them they may not recur. Their incidence may, moreover, be warded off successfully by adrenaline or ephedrine in appropriate dosage. Very frequently dropped beats should suggest the possibility of the onset of complete block with a liability to Adams-Stokes attack.

SUMMARY

To sum up then, the prognosis in heart-block depends on its cause and the degree to which the associated lesions produced by this cause affect the efficiency of the heart. The liability to ventricular standstill carries a very grave prognosis of its own. Such a sign as heart-block affords too narrow a basis when taken by itself upon which to give a prognosis. But it may provide valuable evidence of the presence of myocardial disease which might otherwise be overlooked, and its presence adds an unfavourable point to the outlook in any case where it is found.

TERENCE EAST, M.D., F.R.C.P.,
Physician, King's College Hospital and Woolwich Memorial Hospital.

SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION

PROCEEDINGS OF THE REPRESENTATIVE BODY

THE Representative Body met in London on July 19th, 20th, 22nd, and 23rd under the presidency of Mr. H. S. SOUTTAR.

Sir JAMES BARRETT (Melbourne) was elected president for 1935–6, in consequence of the death of Sir Richard Stawell, and Sir Farquhar Buzzard to the same office for 1936–7. Prof. T. G. Moorhead, Dr. R. Langdon-Down, Dr. R. H. Fetherston, and Dr. W. N. Robertson were elected vice-presidents, Sir Farquhar Buzzard, who was received with loud applause, acknowledged the honour and welcomed the Association to Oxford next year. Sir J. H. MacFarland and Sir Edward Mitchell were elected Honorary Members in commemoration of the first meeting in Australia.

Subscriptions from Retired Members

The hon. treasurer presented a satisfactory balance sheet, which called forth no criticism, but under this heading Dr. B. H. PAIN (Tunbridge Wells) likened the Association to a leaky watering can from which old members trickled out as fast as new ones came in; thus the can remained half full. His remedy was to reduce the subscription for those retired from practice, and he supported his motion by adducing replies to a questionnaire sent to non-members in Kent. The old men of the profession, he said, could give much to, and gain much from, the Association. A long series of speakers concurred, but Dr. A. BEAUCHAMP said that a questionnaire in Birmingham had shown only 10 per cent. of non-members to be aged. The hon. treasurer's statement that Kent's "sob-stuff was not real" evoked protest, but he declared that the Association lost only seventy members a year from retirements and nearly all those who retired in any part of the country apparently went to live in Kent. Dr. MURRAY (Banff) retorted that he did not come from the Garden of England and yet found the same problem, and he supported the motion. "Once a member aye a a member" should, he thought, be the Association's motto. The difficulty, said the Chairman of Council, was to decide when a doctor retired, but Dr. Pain saw no such difficulty, and added, amidst applause, that in any case the Council had been elected to overcome difficulties. The Tunbridge Wells motion asking the Council to consider charging retired members less than the present two guineas was then passed by a very large majority.

"The British Medical Journal"

Dr. R. G. GORDON presented the report of the journal committee over which he presides. Improvements in the *Journal* were of the greatest importance to the whole Association, and might have an influence on membership. Most important was the attraction of the young man into the profession. He should be given a journal which he could not afford not to take, a journal considering general attractiveness of make-up and lay-out as well as other matters. The committee had tried during the year to improve appearance by bolder headings, more cross-headings, and better grouping. Many other changes were in contemplation. Next year a revolutionary programme might be presented.

Torquay, by the mouth of Dr. ERNEST WARD, asked the Council to consider the advisability of devoting part of the *Journal* to matters of interest to junior and senior students. Some of the prize essays might be published, and more reference given to student affairs, such as athletic prowess and history-making.

Dr. GORDON said the *Journal* was primarily for practitioners. More matter was available than could be published, and the *Journal* was hardly the proper vehicle for athletic reports and student activities. (Hear, hear.) The motion was rejected.

Dr. HELEN LUKIS (Kingston-on-Thames) proposed:

> "That the items advertised in the *British Medical Journal* under Houses, Consulting Rooms, &c., should be confined to consulting rooms in bona fide consulting areas: houses sold in connection with an existing practice, nursing homes, residential chambers and general advertisements of house agents: and that advertisements of single houses should not be accepted unless coming under one of these categories."

She said that the motion was the result of grievances by six separate doctors, and related the incidents. She asked who would lose if the resolution were passed, and suggested that the medical man with inadequate capital and the patients in newly-built areas would not be among the losers. Squatters who built up a practice for sale were far too shrewd. Those who came to stay made careful inquiries before settling. Those who came and starved came as the result of answering such advertisements. The *Journal* ought not to lead people up the garden path like that. The loss of revenue to the *Journal* would be very small. The *Journal* was not published for the benefit of advertisers.

Dr. N. E. WATERFIELD (Kingston) supported. He had seen an advertisement of a house in his own small village, which was already well staffed by doctors, who would have had a grievance if someone had been attracted there.

Dr. E. H. NASH (Hounslow) said the matter needed consideration. Some areas were increasing at the rate of 10,000 a year; an advertisement offering a house in such a district did not hurt practitioners already there. It was not dignified to try to keep out all newcomers. Some kind of warning notice might meet the case.

Dr. GORDON expressed sympathy with the motion but agreed on the need for caution. Advertisements were not passed without a good deal of consideration wherever time allowed. He asked Kingston to refer the matter to Council. As it stood, the motion might preclude the advertisement of a death vacancy. Kingston accepted this modification and the meeting agreed.

"Secret Remedies"

Sir Ewen Maclean, chairman of the science committee, moved the adoption of its report. The sum of £1000 was, he said, distributed annually in the encouragement of research, and he hoped the sum would be increased. The tendency had been to shift the value from grants to scholarships, and this had been justified by the quality of the applications received. The Association was very fortunate in its Library and the chairman of the Library Committee (Dr. C. O. Hawthorne). Its arrangement with the National Central Library bestowed very wide possibilities on borrowers. The Sir Charles Hastings and Stewart prizes had been awarded this year to Australasian members.

Newcastle and West Dorset both applied for a new edition of "Secret Remedies." Dr. A. Hedley Whyte (Newcastle) pointed out that the latest edition was dated 1912 and yet was still of use. There was an ever-increasing number of proprietary remedies about which patients frequently asked. Dr. J. A. Pridham (West Dorset) admitted the difficulties of keeping the book up to date and suggested an annual supplement. Dr. E. N. Nash spoke strongly of the ramp of the patent medicine service in this country and of the value of "Secret Remedies" to the practitioner. But Sir Ewan Maclean said the book had not served the purpose for which it was issued and he thought its re-issue would be very inadvisable at the moment. The Chairman of Council emphasised the difficulties of a new issue. He thought some system of differentiation between valuable and worthless secret remedies was very desirable, and said that this possibility was already being explored by a joint committee of the Association and the Pharmaceutical Society. He persuaded the meeting to reject the motions of Newcastle and West Dorset by a small majority.

The British Medical Bureau

Several divisions had on the paper motions disapproving of the relation of the Association with the British Medical Bureau and regretting that body's custom of advertising in the lay press and of allowing commissions. After prolonged discussion in private these motions were lost and the Representative Body recorded its confidence in the directors of the Bureau and its approval of their conduct of the business.

Nutrition—Alcohol—Fractures

The Chairman of Council said that the nutrition committee, over which he presided, had prepared a practical application of the Diet 16 recommended in the Nutrition Report. This publication taught the housewife how to buy, cook and serve the diet advised, and would have wide social consequences. Dr. H. H. MacWilliam (Liverpool) asked if practitioners in distressed areas would be justified in certifying the need for additional nourishment for any person unable to afford this diet. Dr. Nash and Dr. A. K. Gibson (Kensington) thought mismanagement was more important than poverty and laid stress on the amazing amount of waste.

Dr. W. G. Willoughby (Eastbourne) told the Representative Body that a report had been drawn up on the relation of alcohol to road accidents, and would shortly be printed in the journal.

Dr. H. G. Dain took the chair while Mr. H. S. Souttar submitted the report of the fractures committee[1] and emphasised again the fell consequences of discontinuity of medical responsibility.

Mr. McAdam Eccles emphasised the waste of human value and money caused by inadequate treatment of fractures. Dr. R. M. Picken was with him in hoping that the recommendations would be put into force, and mentioned the service the divisions might give in this connexion by bringing pressure to bear on local authorities and voluntary hospitals.

Mr. Souttar having returned to the chair, the Chairman of Council referred to the committee appointed to deal with the physical education of the civilian population and the half-dozen sub-committees dealing with special aspects of this problem. He anticipated that the report would appear early next year and would be of the greatest public value.

Dr. R. G. Gordon countered a complaint by Dr. J. S. Manson (Warrington) that no further account had been given of the activities of the committee on the Medical Aspects of Abortion. Much information had, he said, been collected but a report of adequate measure required more time and more data.

The Report of Council on all these matters was approved.

Mr. H. S. Souttar and Dr. H. G. Dain were elected unopposed as chairman and deputy-chairman respectively of the Representative Body.

Medico-political

A long discussion, which was held in private, took place on the dispute at Llanelly. In the result, a motion was passed expressing confidence in the Council but asking it to continue to strive for a satisfactory solution of the difficulty.

A long discussion took place on the medical services in Llanelly and district, and eventually the following resolution was unanimously approved by the meeting:—

> That the Annual Representative Meeting expresses confidence in the Council, and instructs it to continue to use every endeavour to secure a satisfactory settlement of the dispute at Llanelly.

South-West Wales asked the meeting to deprecate the practice of insurance companies in demanding complicated medical reports in sickness and accident claims with a view to using information so obtained as grounds for refusing renewal of insurance when the time came. Moreover, the patient had to pay. Dr. Bone, chairman of the committee, said the problem was an old and familiar one, and asked what steps could be taken, except by propaganda. The motion was lost. The Isle of Wight also had complaints about insurance. Dr. H. S. Howie Wood contended that a simplified form of report and examination should be instituted for cases where only half a guinea was payable. Dr. Bone accepted this resolution, but could not do the same for the second proposal: that certificates on patients not previously examined should carry a minimum fee of half a guinea—a sum which Dr. C. E. S. Flemming (Council) wished to raise to a guinea. Dr. Howie Wood obtained permission to refer the matter to Council for consideration.

Dr. A. T. Jones (N. Glamorgan and Brecknock) felt that the Council had standardised a flat rate of a guinea for examination and report on workmen's compensation and accident cases, by its opinion that "the usual fee of £1 1s. for this class of work is equitable," and moved that a guinea should be the minimum fee. The motion was passed.

The vexed problem of the encroachment of whole-time medical officers on private practice was raised by Brighton. Dr. T. P. Mulcahy moved that:—

"Whether or not whole-time salaried medical officers appointed to mental hospitals by a local authority should be permitted to engage in private consultant practice should depend, not on the local authority having adopted the scheme on staffing of their mental hospitals outlined in the Memorandum on Treatment of Mental Disability (1932), but on whether or not there is available in the area of that authority one or more private medical practitioners who fulfil one or more of the three criteria adopted by the Association as determining the status of a consultant in psychiatry. When there is such a private practitioner or practitioners available, then whole-time salaried medical officers should not engage in private practice."

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[1] See The Lancet, 1935, i., 383 and 393.

Dr. L. A. PARRY explained that what Brighton wanted was to ensure that if a private psychiatrist was available in an area he should not come into conflict with a whole-time officer. Dr. GORDON expressed sympathy with the motion but pointed out the number of areas where no private expert in mental disease was available. The amendments proposed in the Council's report were the result of discussion with the Medico-Psychological Association. He was reluctant to upset this arrangement, but agreed with the principle. He suggested that a later motion on the agenda would establish the principle without necessitating further discussion with the Royal Medico-Psychological Association. Brighton, touched by his assurances and appeal, withdrew its motion.

Dr. R. EAGER, for Exeter, also wished to modify the Council's report on this matter by adding to it:—

> "In considering the eligibility of a practitioner for one of these appointments, the criteria to which due regard should be given are: (1) Special academic or post-graduate study combined with some actual practice of the specialty; (2) Tenure of hospital appointments affording special opportunities for acquiring experience; (3) Local professional recognition of competence in a consulting and expert capacity; and that para. 52 be amended by the deletion of the words 'are adequately qualified to staff such clinics' and the substitution therefor of the words 'satisfy the criteria set forth in para. 48 V.'"

The report, thought Dr. Eager, gave an impression that six months' instruction was sufficient to qualify a man to treat mental disorder; when he had joined a mental hospital staff he had been told that five years' experience was essential. Dr. GORDON felt that all this was covered by the original words "adequately qualified," but was willing to make the matter explicit if desired. Coöperation was the great essential until such time as it was no longer necessary to use whole-time salaried officers in psychiatric clinics at all. He accepted the motion.

The New Contract Practice

Dr. KEITH GIBSON (Kensington) said that those who were working the public medical services wanted facilities for meeting and discussion, and proposed a motion asking the B.M.A. to provide such facilities. Medical men should be in a position to put things right before a Government department took over any service and not several months later. He received strong support from Dr. S. WAND (Birmingham), who stressed the great expansion of public medical services, and from Dr. HELEN LUKIS (Kingston) who described these services as one of the youngest babies of the B.M.A., cherished by the younger members of the profession who urgently needed advice and help. Dr. BONE doubted if this were a good method of attaining the end desired. The central office had very complete information on the matter, available to any member; existing services were very willing to give help and information; and this proposal was cumbrous and costly. How many of the 51 existing services would send delegates to a conference? He asked for reference to Council if the meeting, nevertheless, wished a conference called. Dr. A. MCCARTHY (Birmingham) denied that the central office had full information; all it had was a record of the mistakes made by individual officers in isolated districts. Dr. HOWARD STRATFORD (Kensington) and Dr. A. GRAY (Wandsworth) thought that now was the time before more mistakes were made, and that a conference would be of great value. Dr. A. BEAUCHAMP (Birmingham) declared that the management of a young child could not wait the twelve months involved by reference to Council. Dr. PETER MACDONALD challenged Dr. Bone's statement that a conference would cost the Association anything. Dr. NASH declared that the policy advocated by Dr. Bone was that which had made a mess of the National Health Insurance Acts. "Damn the expense," he said, "if we want the job done." If public discussion was of no value, what was the representative meeting there for? Dr. C. H. PANTING recalled the early mistakes of the Essex public medical service and the similar mistakes being made by new bodies. Essex had helped 31 out of the 51 existing services. The motion was carried by a very large majority.

Wandsworth, South-west Essex, and Willesden all wanted to ensure that contract practice for persons with incomes over £250 should be a matter of local option. The Council, said Dr. F. GRAY, was still bound by a 15-year-old motion prohibiting contract service on this income level. Contract practice for these people had been approved at Bournemouth for every kind of service except that of the general practitioner. Another medical body proposed to extend the National Health Insurance scheme to the whole population; the B.M.A. had *at present no alternative scheme to offer.*

Dr. C. H. PANTING strongly supported the S.W. Essex motion, saying that contract practice was not a bad thing in itself if properly run. The borderland people needed some service to fit their needs. Dr. C. F. T. SCOTT, speaking for Willesden, said that his area had already drafted a scheme as the need was so manifest. The need was further emphasised by Dr. KEITH GIBSON, but Sir HENRY BRACKENBURY urged that the exact wording be left for very deliberate consideration by the Council. Dr. HOWARD STRATFORD, gallantly fighting in the last ditch, declared that there would be no private practice left if this motion were passed, and that the absolute necessity for it had not yet arisen. He found an ally in Dr. A. B. MURRAY (Banff), who was anxious that the terms should be national and not determined by the local profession. Banff believed that the private practitioner was the backbone of the nation, and was opposed to all contract practice. Nobody there would get a living if this motion were passed. He made an impassioned appeal to representatives not to let down those who strove to uphold the standards of practice, and not to become mere parts of the machine. "Show that you can think for yourselves," he concluded amidst applause, "and take the consequences." Dr. C. S. POOLER (Chesterfield) gave the same advice but urged the meeting to think not in terms of Banff but of the whole country. The resolution binding the Council was dated not 1920 but 1913. Contract practice was not good for patient or doctor, but in the last ten or fifteen years most doctors had been obliged to treat persons over the £250 limit on a contract basis.

Dr. E. R. WALKER (Aberdeen) agreed that this was the beginning of the end but did not regret it. The laity regarded ill-health as a misfortune, and it seemed only logical that they should insure against this as against every other misfortune. He believed that they would never get a real preventive medicine practised until they had a contract system. He was supported by Dr. N. E. **Waterfield** (Kingston) and Dr. **Keith Gibson**, but Dr. C. J. **Palmer** (Nottingham) and Dr. A. C. **Carter** (Bournemouth) thought the motion a regressive one.

Dr. S. A. **Forbes** (Croydon) described the motion as allowing the Council to do in the future what it had done when it thought right in the past. Dr. **Nash** deprecated an attempt to pelt the incoming tide with pebbles of public opinion and preferred to dig channels for the water. Local option, he thought, would be a very dangerous thing, risking a whitling away piecemeal of the Association's strength. Dr. **Howie Wood** (Isle of Wight) maintained that general practice was what general practitioners made it. Those who opposed this scheme were forgetting that the Association considered the welfare of the public as well as that of the doctors. Conditions varied so tremendously that a flat rate was impossible. Dr. J. C. **Arthur**, of Gateshead, said that in his district people with £250–£500 a year were comfortably off and had something put by; they had no desire for a further extension of contract practice; 60 per cent. of them ran cars.

Sir **Henry Brackenbury** strove to clear up misapprehensions. Local option was not to be unlimited; the proposal was that the doctors of an area might apply to the Council to vary the rate of contribution. The usual conditions would apply in all general circumstances, and the matter concerned only voluntary contract schemes.

Finally the motion was carried by 108 votes to 37 (Dr. A. B. Murray demanding a count), in the form as proposed by Sir **Henry Brackenbury** and accepted by Wandsworth, Essex, and Willesden:—

> "That this Meeting instructs the Council to amend Minute 109 of the Annual Representative Meeting, 1920, so as to permit the Council to sanction a higher income limit, should the local profession desire it."

Dr. **Bone** proposed, and carried without difficulty, a proposal to amend the means whereby B.M.A. candidates for election to the General Medical Council are selected. The chief point about the new scheme, he said, was that in future it would be quite clear to everybody that the candidates were Association candidates.

The meeting then carried without discussion another motion by Dr. **Bone**, recommending the Council, pending the 1936 meeting, to treat as rescinded, two statements of Association policy on coroners' inquests: that the office of the coroner should be made administrative; and that the coroner should in all cases view the body. He said that the Council was preparing a statement of evidence to be given before the Departmental Committee on Coroners' Law.

Medical Ethics

Dr. C. O. **Hawthorne**, chairman of the central ethical committee, in moving the adoption of the committee's report, remarked that local authorities sometimes inserted in the lay press advertisements of appointments with conditions which disqualified them from admission to the *Journal*. In such cases the committee was now empowered to insert an appropriate notice in any paper which had printed an advertisement of a vacancy included in the *Journal's* "Important Notices." He also said that difficulty had been experienced by spa practitioners consulted by patients from a distance, since they could not consult with the local medical adviser and were therefore forbidden, on a strict interpretation of the Ethical Rules of Consultation, to treat the patients. To meet this position the Council had ruled that when a patient came to reside for a time at a spa, he should be considered to have left the care of his usual practitioner and the spa practitioner should be free to treat him—so long as the patient continued to reside at the spa.

Opticians

Mr. N. **Bishop Harman**, chairman of the ophthalmic committee, said in presenting its report that the increase in patients seen by the National Ophthalmic Treatment Board had only been 17 per cent. during 1934, but 27 per cent. in the first six months of the present year. Most of this increase had been among patients who came on their own and not from societies, showing that the committee's propaganda had been effective. Thirty-five per cent. of 10,000 patients had had something wrong other than refraction—a strong contrast with the corresponding figure of only 3 per cent. among those seen by opticians. A fresh set of 10,000 figures gave practically identical information, although it came from very scattered sources. They afforded statistical proof of several authoritative opinions that opticians failed to recognise ocular disease. He appealed eloquently to the profession to send their patients to properly qualified ophthalmologists. Some hospitals, he said, were entering into agreements with prescribing opticians, and it was imperative that this movement should be stopped. He deplored the complication of the current certificate of blindness.

Torquay, through Dr. E. **Ward**, put forward a resolution urging the Council:—

> "(1) To approach the Minister of Health by deputation or otherwise and to reaffirm the policy of the Association in this matter pointing out the danger to the eye-sight of patients who are sent to opticians without previous certification or examination, and to urge him to adopt measures which will safeguard the public against such risks.
>
> (2) To notify all contributory schemes, approved societies and such other bodies as make provision for sight-testing by opticians, offering them guidance as to the dangers of such treatment without medical training.
>
> (3) To advise strongly all hospitals lending their names to contributory schemes, which provide such optical benefit, to sever their connexion with such schemes.
>
> (4) To circularise the medical profession of the steps taken above."

Dr. C. M. **Stevenson** (Cambridge), however, said that the Council had already been doing these things for some time. It was largely dependent on local secretaries for the success of its efforts. Mr. Bishop Harman confirmed that the Council had "kept all these things from its youth up," and suggested a general motion of commendation, which the representative from Torquay adopted and which was agreed.

Dr. F. C. **Gittings** (Portsmouth) proposed a meeting of ophthalmic medical practitioners to discuss the difficulties of the Association's benefit schemes. Mr. **Bishop Harman** pointed out that a previous meeting of London ophthalmologists had not been a happy one, that a national meeting would be too large to hold in the great hall of the Association's building, and that the Ophthalmic Committee gave adequate territorial representation. The motion was rejected. He adopted an amendment by Sheffield that the fee for certifying blind patients should be not less than three guineas for a session of two hours.

Osteopaths

Dr. J. W. Bone presented for approval the report of the osteopathy committee, containing the evidence brought by the Association before the Select Committee of the House of Lords. He paid a special tribute to the very careful and exhaustive way in which material had been prepared by Dr. Charles Hill and the staff. The Association had organised and systematised the whole opposition to the Bill. The House of Lords had adopted unprecedented procedure in submitting a private Member's Bill to a select committee with leave for counsel to appear; heavy costs had thereby been involved. Dr. Bone read extracts from the Report of the Select Committee just issued (see p. 213), which appeared to give great satisfaction.

Mr. W. McAdam Eccles thought the Association might congratulate all concerned in this matter on being prompt and thorough and on doing a piece of work which would create history and do good to the rank and file of the profession. Good had been done also to the osteopaths themselves. Those who had a vocation for osteopathy would realise now that the best path for them was medical qualification and registration. The Chairman of Council explained how the machinery of the Association worked in these matters. The general feelings of congratulation and gratitude were expressed in a formal vote of thanks, which was carried with loud acclamation.

Public Health

Prof. R. M. F. Picken, chairman of the public health committee, moved the adoption of his section of the Council's report and discussed the special report on immunisation.[2] He also moved the adoption of the Council's recommendation that the Ministry and local authorities be urged to establish adequate machinery for collecting and storing convalescent serum for use in prophylaxis against measles. Practitioners, he said, could not obtain the serum from official sources or manufacturers, chiefly because the number of convalescents was so small and no adequate arrangements existed for collection. He asked for the coöperation of those in charge of adult patients.

Dr. A. K. Chalmers (Glasgow) accused the profession of playing a part in the failure of compulsory vaccination by giving way to the mother's plea for "ane mark and a wee ane." He thought the Association ought to play a part in educating the public. Dr. Nash desired to include "adult serum" in the recommendation. Parents, he said, often objected to the necessary quantities of blood being taken from their convalescent children, but he had obtained adult serum in adequate quantity and quality from Rover scouts. Dr. Picken, however, demurred on scientific grounds, as the action of convalescent serum was well known, and special machinery would be necessary to collect adult serum.

Dr. D'Ewart (Manchester) doubted gravely whether convalescent serum either was to be obtained in great cities or was as valuable in treatment as adult serum. Adult serum was easily obtainable in Manchester.

Dr. Chalmers moved a motion welcoming the report and asking that it be forwarded to each division. He said his object was to get divisions to combine and work on a uniform plan. The population would only submit willingly to vaccination in the presence of an epidemic, and better results would be obtained without compulsion.

Dr. Picken, moving the remainder of the report, thanked *The Lancet* and the *Journal* of the Society of Medical Officers of Health for coöperating with the *British Medical Journal* in the selection of advertisements of vacancies for publication. Much work was involved in seeing that these advertisements conformed to the requirements of the Association.

Midwifery in General Practice

Dr. A. Keith Gibson (Kensington), proposing that the Council should investigate the serious diminution of opportunities for midwifery in general practice, pointed out that the practitioner wished to do the work and found the chances very small, because large numbers of patients were absorbed by hospitals, not for the ordinary good reasons but because it cost them less. The problem was analogous with that of out-patients. In Kensington, patients were being referred through the M.O.H. back to the private practitioners, but a process of "Dutch auction"—general reduction of rates—was widespread.

Dr. Picken accepted the motion for the Council, and it was agreed. In moving the remainder of his report, however, he raised the subject at length in speaking of maternal mortality. The Association had, he said, recently carried out an investigation through private practitioners into the causes of maternal mortality, the only group of diseases against which a national public health campaign had proved unsuccessful. The Joint Midwifery Council had reported very rapidly, but had been able to use the results of much previous research. The Public Health Committee, in considering the report, had found itself in a difficulty. The Association's scheme was founded on continuity of treatment by the private practitioner, whereas the Joint Council had rather concentrated on the position of the midwife, the hub of its report being the need for a municipal midwifery service. The Association's Council had therefore appointed a special sub-committee to consider afresh the national maternity scheme of the Association with special reference to the Joint Council's report. He invited discussion by the meeting, so that if the Council of the Association had to take action before the next A.R.M. it might have some knowledge of what general practitioners felt.

Dr. A. Baldie (Kensington) claimed that Kensington was peculiarly entitled to an opinion, because its practitioners were surrounded by legitimately competing institutions. Over the whole country, however, the process went on of training doctors on the material they ought to be treating after they qualified—the profession manufactured and swallowed its own tail. Some arrangement should be made for institutions to charge a fee to women who could afford it. Efforts should be made to combat propaganda based on the alleged incompetence of general practitioners. The doctor was competent, though he might be out of practice through the incompetence of the community to provide him with opportunity. Midwifery should not be regarded as a specialty; childbirth was a physiological process and not a disease. Specialists should link up with general practitioners to formulate a scheme whereby the profession would not be faced with the fait accompli of a midwifery service run by laymen. No lay interference, political or otherwise, should be tolerated.

Dr. H. Guy Dain (chairman, Insurance Acts Committee) drew attention to the new prevalence of obstetric shock, and moved:—

> "That the B.M.A. regrets that the question of maternal mortality has become the subject of widespread political

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[2] THE LANCET, 1935, i., 1507.

discussion, receiving great publicity in the lay press. Maternal mortality is a scientific and administrative problem which deserves careful and scientific study, but in the experience of practising doctors, the publicity which it is receiving to-day is tending to terrify child-bearing women and is, in itself, a cause of increased mortality."

This motion, seconded by Dr. A. BEAUCHAMP (Birmingham), was carried amid cheers.

Dr. A. B. MURRAY (Banff) claimed a mortality-rate in his district of one per thousand, and ascribed its lowness to a good general practitioner service. He feared that a service of whole-time midwives would lead to a service of whole-time doctors. A municipal service in his area would be prohibitively expensive.—Dr. KILLICK MILLARD (Leicester) declared that before the profession accepted the Joint Council's proposal, it should be satisfied that it represented the best solution.

Dr. H. H. MACWILLIAM (Liverpool) strongly supported the proposal for a salaried midwifery service. Liverpool midwives could not make an adequate income in private practice. He hoped they would be sent into suitable hospitals to enlarge their education, and to learn that "obstetric shock" was a refuge of the destitute and that such deaths were due to some other cause than fright induced by political propaganda.—Dr. C. F. SCOTT (Willesden) complained that Willesden borough council had built a maternity hospital five miles away, into which no doctor could follow his patient. Harrow, on the other hand, had opened a home into which general practitioners were invited, and paid them—instead of whole-time officers—if the patients could not. The patients much preferred being attended by their own doctors. —Dr. J. LIVINGSTONE (Barrow-in-Furness) deplored the practice of midwives in some areas of sending for certain doctors and not the patient's own attendant. This abuse should be brought to the attention of the Central Midwives Board, as relatives would not coöperate in local action.

Dr. J. MIDDLETON MARTIN (Gloucestershire) was astonished that the Joint Council should prefer a municipal service of midwives in view of the splendid clinical record of such bodies as the Queen Victoria's Jubilee Institute of Nurses. The best constructive suggestion so far was the scheme for antenatal examination by the practitioner who, at the request of the midwife, would attend the confinement. The more a midwife was encouraged to think of herself, the greater the likelihood of her interfering in a situation which needed the doctor.

Dr. D. O. TWINING (Plymouth) urged the claims of the rural district to a whole-time midwife. He did not like the district nurse to double the part, thinking that she would be a better nurse if she did not do midwifery and a safer midwife if she did not come to a confinement from other patients.—Dr. BEAUCHAMP suggested that midwives were often afraid to notify a temperature, but that a woman was as safe in her own home, attended by her own doctor, as anywhere. —SIR EWEN MACLEAN (Council) pointed out that of the women confined in England and Wales, about 65 per cent. were attended throughout by midwives and 10 per cent. went to hospital; this left a quarter —about 172,500—for the general practitioner. The standard of midwifery in the country must be set by the general practitioner. No scheme was possible which contemplated dividing the doctors of the country into those who might take part and those who might not. The base of an efficient system was a competent midwife. In many areas, a whole-time salaried service would be entirely inadvisable; in some nothing else would answer the purpose. The new sub-committee, the Council, and, next year, the Representative Body would have most carefully to consider the whole position.

Dr. W. PATERSON asked what the general practitioner thought of having large numbers of midwives as municipal officials. In answer to his invitation Dr. WATERFIELD championed the district nurse, whose knowledge of the people and hold on their confidence, were a great asset. The risk of infecting mothers from other sources was, he thought, very small. The patient should have some choice of midwife. As a practitioner, he preferred to be able to get his midwife assistant changed if necessary, and a local authority was much less approachable than a district nursing association.—Dr. W. G. THWAITES (Brighton) said that the usual patient who went wrong was a young married woman, who was physically unfit through tinned food, hard work, and indiscreet recreation. The Council should use these facts in combating political accusations of inefficiency.

Dr. W. G. WILLOUGHBY (Eastbourne) stated that the municipal home of which he had charge confined 35 per cent. of the mothers of the area, and the general practitioners often insisted on their patients going into it. Divisions should discuss this problem with their medical officers of health.—Dr. C. E. S. FLEMMING (Trowbridge) thought it did not matter whether the midwife was appointed by a municipality or a district committee, so long as she was competent. If the medical advisory committee was good, there should be no difficulty about approaching the local authority, who were often better able to choose a good nurse. The Queen's Nurses in Victoria, Australia, who handled cases of all kinds, showed a mortality-rate under 1 per 1000.—Dr. A. LYNDON (Guildford) supported the plea for a part-time midwife under an association. In his area the association sent its candidates to a small hospital for two years' training, and to a recognised school for their C.M.B. In his village there was a nurses' cottage with a good two-bed maternity ward. The nurses knew the whole circumstances of the patient, and the patient could select the nurse.

The motion to adopt the rest of the report was carried.

National Health Insurance

Dr. DAIN (chairman of the Insurance Acts Committee) moved his committee's report.

Dr. BALDIE (Kensington) moved that any scheme for supplementing general practitioner's service for insured persons by expert treatment and laboratory service should be initiated and administered in collaboration with the representatives of insurance practitioners. He stressed the need for auxiliary services such as radiological and pathological examination. He prophesied the necessity for modifying the dual control over insurance practice, and urged panel practitioners to put forward their own scheme in good time, to anticipate control by laymen and medical experts. Panel representatives would assert the principle of medical control of all services, administrative and clinical.—Dr. DAIN warmly approved the principle of the motion, and it was carried unanimously.

Dr. J. C. ARTHUR (Gateshead) opposed the Council's suggestion, at a time marked by encroachment of all kinds, to set up a clinic to diagnose and treat anæmia. A general practitioner could estimate hæmoglobin in a few minutes and test whole blood in a quarter of an hour. He deprecated what he called a declaration of the general practitioner's incompetence. Nevertheless, the meeting accepted the committee's report without dissent.

Tunbridge Wells, through Dr. B. H. Pain, moved a motion desiring the abolition of the compulsory statistical compilation of national health insurance cards, and asking that such cards be used *primarily* for clinical notes. He asked for voluntary record-keeping, more clinical and less statistical, and for requests for accurate records on some one disease, to be sent to the Medical Research Council. Panel doctors would then feel themselves fellow-workers with the greatest research students. The Ministry must now possess all the statistics they needed.—Dr. Howie Wood (Isle of Wight), in support, compared the relationship between the panel doctor and the regional medical officer with that of a stern schoolmaster and a recalcitrant pupil. In his area the practitioners prided themselves on putting down all possible clinical data, but did not meticulously note every attendance. They, however, had a reasonable R.M.O.—Dr. Flemming said the real objection to recording the number of attendances was that the Ministry regarded these figures as a measure of the value of the practitioner's work.

Dr. A. B. Murray boasted that this reform had been accomplished in Scotland five years before. The Scottish Board of Health had replaced the records by a return of patients needing admission to hospital, and then by clinical returns—e.g., on early signs of cardiac and valvular disease. It was hoped that a more elastic scheme would be provided, allowing the doctor to record matters which chiefly interested him. His scientific work was more valuable than the collection of statistics.

Dr. Dain replied that panel doctors already kept clinical records, the quality of which was improving. The Ministry were agreeing to lay less stress on the statistical side. He did not find the marking of the cards any burden, as some colleagues seemed to find it. Those who kept these records well were more likely to keep good clinical ones than those who resented doing so. He hoped that the Representative Body would not express an opinion on a business matter concerning only panel practitioners and the Ministry.

Sir Henry Brackenbury, while expressing himself as in favour of the motion, agreed that the matter should be left to the Panel Conference. His opinion that a divergence of opinion between the two conferences would be a lamentable thing was shared by a large majority, and the meeting forthwith passed to the next business.

Consultants and Specialists

Prof. A. H. Burgess (chairman of the Consultants' and Specialists' Group Committee for England and Wales), moving a recommendation that domiciliary attendance by a consultant should, when possible, be provided by a consultant in private practice, explained that a certain county council had advertised for whole-time salaried staff for their hospital, on condition that successful candidates must act as consultants to general medical practitioners outside if called on, the fee to go to the council. This council proposed to make the services of its obstetric consultants available to some of its local authorities for maternity and child welfare work. The recommendation would not affect consultations on notifiable diseases. The Council of the B.M.A. would, if the meeting accepted the resolution, request divisions and branches to enact ethical rules in the same sense. This was carried unanimously by vote, and became the policy of the Association.

Prof. Burgess, proposing the adoption of the remainder of this report, said that his Committee were in favour of the principle of extending National Health Insurance under suitable conditions. He also proposed:—

> "That it is in the general interest of the public and of medicine that consultant members of staffs of council hospitals should, as a rule, be part-time and not whole-time officers."

He pointed out that the part-time officer had the stimulus of consultation with the general practitioner, and sometimes of association with students; he was also available for the public and allowed greater freedom of choice of doctor and absence of red tape.

Dr. H. Robinson (Kensington) moved to refer this back to Council, on the ground that it was based on conditions obsolete since 1929, and supported his contention with many instances. The policy of the Association, he said, must not only be in the public interests, but must also appear to be so; he feared that the proposed resolution would arouse the opposition of the public and of the L.C.C. He received the support of Dr. E. W. G. Masterman (*Council*), who regarded the motion as very dangerous. He was most anxious that municipal hospital officers in charge of severe cases and instructing students—as they now did in many hospitals—should be specially qualified for their work. The resolution might block this desirable procedure. The authority of Sir Henry Brackenbury, however, was thrown into the scale on behalf of the motion which, he admitted frankly, was a general rule with very many exceptions. London was unique, and its Council was tackling its vast job extraordinarily well; nevertheless it should not govern the rule for the whole country. The rules had been formulated in 1930, because of the 1929 Act, and did not antedate it as Dr. Robinson had suggested. If a large number of counties appointed whole-time consultants with liberty to act as private consultants throughout the area, private consultant practice would not be worth having in the future. One large county had already adopted that method, and if the Association could, it had to stop it at the beginning.

The Chairman of the Council emphasised the warning against taking London as a standard, and assured the meeting that the matter had been debated again and again in Council, and reference back could lead to no different result.

Dr. M. W. Renton (Dartford) pleaded for consideration of the part-time general practitioner, to whom far more scope should be given on the staffs of these hospitals. He argued that he was in order in mentioning general practitioners, because the interests of the consultants were identical with theirs and evoked applause by his commendation of their work on these hospitals. Consultants must not be cloistered, declared Mr. Bishop Harman, returning to the point, and urged the meeting to reinforce the view that the best consultant was he who worked both in hospitals and in private. Dr. Robinson was not dismayed by the forces ranged against him, but failed to carry more than a few of the members with him.

West London Hospital.—Princess Arthur of Connaught visited this hospital on "pound day" to receive the gifts from visitors. Nearly a thousand school children were present to make their contributions. It is hoped before the end of the year to complete *the* new buildings, which will be known as the "Silver Jubilee extensions."

THE OSTEOPATHS BILL

REPORT FROM THE SELECT COMMITTEE

ON April 12th the sittings of the Select Committee of the House of Lords appointed to consider the Registration and Regulation of Osteopaths Bill were abruptly terminated, the supporters of the Bill having withdrawn their support, before all the witnesses against it had been heard. The Committee, which consisted of Lord Amulree (chairman), Lord Dawson of Penn, Lord Elibank, Lord Esher, Lord Carnock, Lord Marley, and Lord Redesdale, have now issued a unanimous report which is set out below.

1. The Committee have occupied twelve days in their inquiry, in the course of which they have examined twenty witnesses. Before the evidence of those opposing the Bill had been concluded the supporters of the Bill intimated that they did not desire to ask the Committee to recommend that it should be proceeded with.[1] The Committee, however, conceived it to be nevertheless their duty to report in detail to the House.

2. The principal object of the Bill was stated to be the protection of the public against the practice of osteopathy by incompetent or unqualified persons. Learned counsel, in opening the case for the Bill, put it to the Committee that it would be sufficient for him to establish (*a*) that osteopathy is extensively practised, and (*b*) that the public in large and increasing numbers are desirous of being treated by this method. On these hypotheses he asked the Committee to deduce that Parliament should authorise the establishment of a state register for osteopaths, with a prescribed qualifying education and standard of proficiency; in fact, to accept the Bill in principle.

3. In all comparable cases of vocations for which a statutory register has been authorised, three conditions have been fulfilled, viz. :—

(i) The sphere or territory within which the vocation operates has been clearly defined.

(ii) The vocation has already long been in general use.

(iii) There has been already in existence a well-established and efficient system of voluntary examination and registration.

The establishment of a state register moreover not merely protects the public from the unqualified practitioner, but gives the guarantee of Parliament that persons of the class proposed to be registered are within their own sphere worthy, and the only persons worthy, of the public confidence. Instances (besides the medical register) are the registers of dentists, pharmacists, midwives and veterinary surgeons. The province of each can be clearly defined, the practice of each is universal, and each was in a state of efficient voluntary organisation at the time when the statutory register was established.

4. In the case of the osteopathic calling none of these conditions can be said to be fulfilled, for the following reasons :—

(i) No definition of osteopathy was included in the Bill as introduced, and although one was subsequently proposed for inclusion in the Bill, and others suggested, none emerged which satisfactorily differentiated the osteopathic sphere of activity.

(ii) The practice of osteopathy, though widespread in the United States of America and Canada, is carried on in the United Kingdom by not more than two to three thousand practitioners, of whom only about 170 can claim to be "qualified." It is practically unknown on the continent of Europe.

(iii) The only existing establishment in this country for the education and examination of osteopaths was exposed, in the course of evidence before us, as being of negligible importance, inefficient for its purpose, and above all in thoroughly dishonest hands. Pending the setting up of any adequate machinery in this country, therefore, the only training ground for the qualified osteopath would be North America, and it was pointed out by the representative of the Ministry of Health that "it is alien to the general principles which have so far been followed in comparable legislation to recognise qualifications which are conferred by foreign educational institutions." Moreover the Committee had no evidence before them as to the standard of education of osteopaths in North America.

5. In view of the fact that the establishment of a statutory register would give something in the nature of a "hall-mark" to osteopathy, the Committee felt it their duty to inquire at some length into the nature and value of osteopathic treatment. It emerged clearly that osteopathy is not—as is popularly supposed—a craft or art limited to the treatment of maladies or defects of the bones, joints, muscles, ligaments, &c., by manipulation; in this sphere the Committee have no doubt that qualified osteopaths perform valuable services. They may even possibly be regarded as having at one time developed a technique in advance of medical science, which has been to some extent accepted by members of the medical profession who practise what is called "manipulative surgery". Osteopathy, however, claims to be a method of healing which is suitable for the treatment of *all diseases of any description*. "We claim," said Dr. Streeter in evidence, "we have a different school of healing, and we want provision made for it, and an orthodox curriculum. We want to develop along our own lines; we feel we are just as competent as any physician to act as a family physician and general practitioner."

6. As the law stands, anyone is entitled to practise the art of healing, but only registered medical practitioners are entitled to hold themselves out as duly qualified to treat all diseases. Were the present Bill to pass, registered osteopaths would be entitled to make a like claim. It is true that, on no logical principle, provisions were proposed for insertion in the Bill, excluding osteopaths from the right to perform "major surgery", to practise midwifery, to administer anæsthetics and to give certificates of the cause of death; but neither of the distinguished practising osteopaths, who gave evidence before us, would recede in any way from the full claim of osteopathy to treat all disease.

7. It is hardly necessary to point out the far-reaching nature of this claim, involving as it does the statutory recognition of two alternative, and to a great extent conflicting, theories of healing. Dr. Kelman Macdonald explained his views as to the scientific basis upon which the osteopathic theory reposes, and the Committee would wish to pay a tribute to the ability and sincerity of this witness; but Dr. Macdonald is actually a registered medical practitioner, and, whilst he clung to the formulæ on which osteopathy is based, it was clear that in actual practice he would not deny his patients, where

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[1] The reasons given by the supporters of the Bill were as follows :—

(*a*) That they desired what they considered to be the scientific basis of osteopathy to be further explored.

(*b*) That they could not properly ask for a measure which required for its full operation the granting of powers to the British School of Osteopathy, the present constitution of which the principal supporters did not approve.

necessary, the benefit of appropriate medical or surgical treatment.[2]

8. The Committee accept the claim that cures are frequently effected by osteopathic methods. On the other hand there have been some failures. The same may be said of other methods of healing. The Committee have not been in any considerable degree influenced by evidence either of cures or of failures.

9. The Committee find on the evidence before them that the claim of the osteopaths to be able to treat all diseases as set out in the Bill has not been established, and that it would not be safe or proper for Parliament to recognise osteopathic practitioners as qualified, on a similar footing to that of registered medical practitioners, to diagnose and treat all human complaints.

10. Further, the Committee are of opinion that the question of establishing a register of qualified osteopaths by Act of Parliament should in any case be deferred until the sphere of osteopathy has been defined, and a system of education in the principles and practice of osteopathy has been developed in this country in one or more well equipped and properly conducted institutions.

11. A question was raised in the course of the hearing as to whether there should be what was described as a "scientific" inquiry into the merits of the principles and practice of osteopathy. The president of the General Medical Council said he had no objection to such an inquiry. The Ministry of Health considered that before any register was authorised by statute the theory and practice of osteopathy should be established by such an inquiry. As already stated, the Committee have reached the conclusion that the claim of the osteopaths to be able to treat all diseases has not been established and they are satisfied that such conclusion is sound.

12. The Committee, in view of the considerations set out above, have ordered that the Bill be reported to the House without amendment, and recommend that it be not further proceeded with.

MEDICINE AND THE LAW

Damages for Slippery Floors

IN Weigall *v.* Westminster Hospital, Mr. Justice Horridge, last week, awarded the substantial sum of £2826 to a plaintiff who broke her thigh by slipping on a polished floor at the hospital's annexe at Hampstead. Mrs. Weigall, the plaintiff, was visiting her son who was a paying patient at the hospital. While inside the building she went to see the consulting surgeon. The floor of the room was covered with highly polished linoleum; near the fireplace was a mat which suddenly slipped when she put her foot upon it. She fell on her side and broke her left thigh; in consequence, her left leg is now an inch shorter than the right. It was negligent of the defendant hospital, she contended, to put a mat on a slippery floor without taking proper steps to ensure that it would be stable when trodden on. The defendants denied negligence and suggested that the fall was a mere accident caused by Mrs. Weigall losing her balance on suddenly turning round to speak to the surgeon. There was also apparently, at one stage of the case, an argument that there was not the same duty to the plaintiff if she went to see members of the staff in their rooms as when she merely went to see a patient. The judge found for the plaintiff all along the line. He accepted her account of the cause of the fall. He said there was an implied contract that she should be at liberty to visit her son, and also that she should be at liberty to consult the surgeon with regard to her son's condition. That was the normal course of events when she visited her son. She was present on the hospital's premises as an invitee. The judge cited and followed a decision of Lord Hailsham to the effect that, where persons are present by the invitation of the occupier, there is a duty upon the occupier to take reasonable care that the premises are safe. In Mrs. Weigall's case the court was satisfied that there had not been reasonable care. The defendants could not say they were unaware that the floor was highly polished; indeed the secretary of the hospital had said that it was kept polished for antiseptic purposes. If mats were placed on such a floor, there was a duty to take some precautions to prevent them slipping. The defendants ought to have known that the mat might slip, and the plaintiff was not to know that no precautions had been taken to prevent it slipping. Mrs. Weigall had not been guilty of any contributory negligence; it was not for her to take care to see that the defendants had secured the mat before she put her foot on it.

The slippery mat on the highly polished floor at the hospital—which his Lordship found to be an "unusual danger" within the knowledge of the hospital—would equally be taken to be a want of reasonable care if it led to accident inside the house of a surgeon or physician. The case of Weigall *v.* Westminster Hospital is a warning. The hospitals indeed, have been warned already. A year ago an elderly patient in a Yorkshire hospital, getting out of bed in the absence of the nurse, slipped on the polished floor and sustained injuries which accelerated his death. The coroner[1] commented on the danger of polishing the floor of a ward where elderly and infirm patients were accommodated, especially if the patients wore leather-soled slippers. A year earlier[2] the question of suitable hospital flooring was discussed in our columns in connexion with a report on hospital construction, compiled by an international congress. A floor covering should be both silent and safe, and, as we then ventured to say, the surface should not be one which by any process known to woman can be polished. We were thinking of the safety of house surgeons and nurses as well as that of patients. Mrs. Weigall's successful claim is a reminder that visitors also have to be considered and that their accidents, unless covered by insurance, may have a disturbing effect on hospital finance.

Obstructing a Coroner

It is a criminal offence to dispose of a dead body so as to prevent a coroner from holding an inquest. The offence varies greatly in seriousness. It can be aggravated by suspicions of murder, or, as appears from the following case at the Old Bailey last week, it can be a trivial matter meriting no grave punishment. An old man named Ellis disappeared on July 5th, 1934. About a year later his body was found in the cellar of a public-house in the Blackfriars-road. On the day of his disappearance he had visited the public-house and had fallen through the trapdoor of the cellar (which ought not to have been left open) and had thus met his death. The barman of the public-house, possibly afraid of being scolded for not having closed the trapdoor, disposed of the body by hiding it in the cellar. There was this to be said for the barman—he had just had to give evidence about another accidental death at the public-house and, being perhaps of a more sensitive nature than others who follow the same calling, he had flinched from repeating the experience of being a witness at a second inquest. The medical evidence established that Ellis's death was due to the accidental fall through the trapdoor; there was no suggestion of foul play. When Ellis's body was at length discovered, the barman made a full and frank statement which the police were able to accept as true. He was indicted for unlawfully disposing of Ellis's body with intent to prevent a coroner's inquest, when such inquest ought to have been held. He pleaded "guilty" and received the nominal sentence of three days' imprisonment, which, in the circumstances, meant that he was forthwith released from custody.

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[2] On the other hand, in answer to a question whether the Bill would "provide a bridge over which one will be able to pass and meet the other in the middle," he answered, "I think so, but on the other hand, you must remember that our views on the actual causation of disease, and our general guiding principles, and our form of treatment are all at complete variance with those of the medical school."

[1] THE LANCET, 1934, i., 1376.

[2] Ibid., 1933, ii., 392.

The particular offence with which the barman was charged is not committed unless an inquest ought to have been held on the body. This point was brought out in R. *v.* Purcy,[3] where members of a homeless family left in a hedge the body of a child. The child had been ailing and ill-nourished, but there was nothing to indicate that the death had been due to criminal negligence. The death would consequently not have been one for investigation by the coroner. In the Court of Criminal Appeal the Lord Chief Justice seemed to hold that the Purcy family had not committed the crime with which they were charged, because an inquest would not necessarily have been held. In the recent case of the barman, an inquest would presumably have been held upon the death of Ellis who fell through the trapdoor, but it looks as though the barman had an excellent defence. The Recorder accepted the statement that the barman had no real intention of committing any offence. An unlawful intention to prevent the inquest was, however, an indispensable ingredient of the crime. If the barman had no such intention—if, for instance, he hid the body to escape being scolded about the trapdoor—he was entitled to be acquitted, and he need not have pleaded "guilty."

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE OUTLOOK FOR NEW MEDICAL GRADUATES

NEARLY 200 degrees were conferred at the medical graduation at Edinburgh University last week, and Prof. R. W. Johnstone, F.C.O.G., in his address as promotor, was able to provide some interesting information and comments on the prospects of professional success at the present day.

The State, having made itself partly responsible for the health of the people, is, he said, finding itself more and more deeply committed, and future extension of the National Health Insurance Acts will probably lead to 90 per cent. of the population of the country being either "on the panel" or under public assistance schemes. The field of private practice is likely, therefore, to become greatly restricted, but as an offset to this there will be a considerable and probably disproportionate increase in the number of salaried appointments. The position of the voluntary hospitals will inevitably be effected; the change is already in process, and the outcome is a matter of deep concern. The present system of providing free medical attention and accommodation for those who are in no real sense in the category of the necessitous poor must call for revision.

In success or failure, Prof. Johnstone said, character and personality counted for more than intellectual ability and still more than mere knowledge. He went on to give the results of his investigations concerning the degree of professional success achieved by the 1766 men and women who graduated as bachelors of medicine and surgery at Edinburgh from 1900 to 1909. Of these, 53 were killed or died in the War, and 268 have dropped out of the live roll, mainly by death; the Medical Directory still contains 1445 of the 1766 names. From his analysis Prof. Johnstone estimates that just under 3 per cent. have achieved distinguished success, 31 per cent. considerable success, and 55 per cent. a fair degree of success. There remain 11 per cent. who cannot be traced, many of whom are probably failures. One-third of the total, therefore, have achieved more than just a moderate degree of professional success. Eighty per cent. have entered general practice, and only 30 per cent. have taken the degree of M.D. One or more of the higher diplomas have been taken by 26 per cent. and the fellowship of one or other of the Royal Colleges by 16 per cent. One man is an F.R.S., 38 have become professors, and 68 are lecturers in universities of the Empire or in America. Fifty-five are on the staffs of teaching hospitals, and double that number on the staffs of large non-teaching hospitals in Great Britain. A total of 62 have become medical officers of health of large cities or counties, and 30 are superintendents of asylums. The regular Imperial Services have absorbed 192, two-thirds of them in the Army Medical Services. Of 100 women on the list, 60 have married.

The promotor pointed out that there is an impending glut in the medical market, but he did not think there was any occasion for alarm, since the supply was likely to adjust itself to the demand. In conclusion he said that the doctor whose aim is simply to do as much good to his patients and fellow men as he can, may thereby gain a serenity of mind which will make his life a complete and rounded success, quite independently of such matters as professional distinction and financial prosperity.

VIENNA

(FROM OUR OWN CORRESPONDENT)

THE NEW DISPENSATION IN MEDICINE

THE Government has long promised fresh legislation on health insurance and old age pensions as part of its reorganisation programme. Particulars of the new law were not made public in advance, for the present "autocratic" system of government has done away with parliamentary institutions, and the federal council can do no more than accept or reject the Bills presented to them by the government or ministries. It is even likely that the representatives of the medical profession sitting on this council (who were elected as well as nominated by the government) were neither asked nor allowed to express their opinion. The law came into force on July 1st after a transition period of three months. During this period, which was designed to familiarise the public and the authorities with the new system, the changes actually effected were very slight; passive resistance appeared to be widespread. The perpetrators of the law (if this expression may be used) evidently realised that it was not an ideal solution, for they have limited its working to a trial period of five years.

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[3] Ibid., 1933, i., 1035.

As soon as the law was published it was criticised and opposed, both by the medical profession and by the insured persons. In medical journals of differing standpoints it was emphasised that the results would be ruinous to the medical profession unless radical changes were soon introduced, and the justification of such complaints will soon be apparent. The chief aim of the new scheme seems to be economy in social expenditure; benefits for the insured persons and medical salaries are alike to be cut down. Allowances for medical treatment, accommodation in hospitals, benefits during sickness and convalescence and old age pensions have all been severely "axed," sometimes by as much as 40 per cent., and the effect on public health is bound to be unfavourable. Not only are the benefits of insured persons to be reduced, but sickness insurance is henceforth to be limited to the wife (or husband) of the wage-earner and to children under eighteen years of age. Old age pensions are being reduced by 25–40 per cent., and will be paid at sixty-five instead of sixty. The maximum payment, which is made to members with forty years' subscriptions, will be 280 Austrian schilling (£10 15*s.*) a month instead of 400 schilling.

The following regulations will affect the medical profession. Under the auspices of a central union called the Federal League of Social Insurance (Der Reichsverband der Social-Versicherungs-Träger) there will be a committee (Arbeitsgemeinschaft) in each county, corresponding to the present Krankenkasse or sick club. This will supply medical and dental aid, allot sick pay, and make financial arrangements with doctors, dispensaries, and other institutions. A special medical committee will deal with the appointment of doctors, and in coöperation with the main committee will settle any differences of opinion which may arise in the administration of the new regulations. The medical committee will consist of an equal number of representatives of the local medical organisation and the general insurance committee, but the chairman will be a layman, preferably a high official of the federal civil service appointed by the local government. Insured persons may choose their doctor or dentist from a panel of approved practitioners, admission to which is open only to Austrian citizens with a medical degree from an Austrian university. Insurance doctors must have done at least four years' medical work, including at least three years in a public hospital or sanatorium; they must have experience of surgery, obstetrics, and internal medicine, and have acted as locum tenents to a general practitioner for at least three months. Consultants must have had 4–5 years' training in their specialty in a recognised hospital; and dentists must have spent two years in a dental department and two years in private practice.

A candidate for admission to the panel must satisfy the authorities of his good citizenship and blameless professional behaviour. A novel feature is the condition that no doctor may be appointed to this list if he draws a fixed income of 12,000 schilling (£480) a year from other permanent medical employments or from other public sources. Nobody in the new State may derive a double income from public funds; but specialists are exempt from this condition. Even if the candidate has fulfilled all these requirements his admission to the panel service under the social insurance law is at the discretion of the medical committee, and it has been pointed out repeatedly in medical journals that this "discretion" is a very severe test of the impartiality of members of the committee. Not only may racial, religious, political and economic factors influence their decision, but also personal likes and dislikes.

Formerly a panel appointment carried with it either a fixed income for the sick-club doctor, or a sliding income per head. Now a fixed percentage of the income of each county committee will be devoted to the payment of the doctors on its panel, and this sum will have to cover all expenditure for medical aid. The services of the doctors will be paid according to a system of "points." Every visit, operation, consultation, or dressing will represent so many points, and the doctor's monthly salary will be decided by the number accumulated. The value of the point will fluctuate according to the amount of money available. But the point value for the workmen's Krankenkasse may be different from that in the employee's Krankenkasse, and the point value may (and most likely will) vary from year to year. The medical committee is entitled to discard this system, and in any suitable case establish instead for the benefit of an individual doctor a fixed salary. This may be done in any district or part of a district for special reasons which are again left to the discretion of the committee. Thus we find again those opportunities for differentiation, discrimination, and arbitrary decisions among the panel doctors which have already been bitterly criticised in the medical press.

The main object of the new law is admittedly to save expense, and it is certain that a number of doctors will be gradually dismissed from the Krankenkasse. The following regulations have been drawn up for such dismissals: a practitioner with less than ten years' service may be dismissed within one year after the new law comes into force. He is, however, entitled to compensation depending on the length of his service, the maximum being one year's salary. If he is later readmitted to the panel, he must refund this sum in monthly instalments. A practitioner with more than ten years' service has hitherto been entitled to a pension. All previous agreements to the effect that a panel physician may not be dismissed except by reason of gross default are declared invalid, and a pensioned physician who is readmitted to the service under the new law receives no pension during the time of his service. The administration of these rules is also in the hands of the medical committee, and the doctor has no right of appeal.

These brief notes on the new law are proof enough of its spirit and contents. They show the great power of the committees and the defenceless position into which the profession has been manœuvred. This impression is intensified by the fact that under the new law there is no longer the hope of a pension after prolonged service. The chief advantage which the new regulations bring is the abolition of all fixed salaries, and that, nominally at least, the chances are now the same for all. Another advantage is that the patients may choose the doctor they have most confidence in. But on the other hand, the doctor may only prescribe approved remedies, and will have to give up many medicines to which he has become accustomed, for the list of drugs has also been cut down. Taking it all in all we see that our profession is hampered, its expectation of a decent payment for its work are nullified, and the doctors themselves are threatened by proletarisation since private practice is dwindling away. Indeed, as several medical journals emphasise, the necessity for alterations in the law, even before the lapse of five years, is obvious, for although the "transition" period of three months has passed without radical changes in the staff of the existing sick-clubs many doctors fear the coming autumn. And a man who loses his post in the panel service will hardly be able to find a living elsewhere.

CORRESPONDENCE

THE SMITH-PETERSEN NAIL

To the Editor of THE LANCET

SIR,—The directing apparatus for the insertion of Smith-Petersen nails, described by Mr. Eric Lloyd in your last issue, shows great ingenuity; complicated as it may be he has succeeded in greatly simplifying the apparatus of Sven Johannsen. Nevertheless, from experience with other types of directing apparatus one is driven to the conclusion that this is yet another instrument subject to instrumental error which introduces unnecessary complications and difficulties into the technique of insertion of the nail.

There is only one drawback to the use of Smith-Petersen's nail for fractures of the neck of the femur. Unless the nail enters exactly into the centre of the proximal fragment there is a danger of refracture of the head of the femur with redisplacement. While it is true that Mr. Lloyd's apparatus by controlling alignment in two directions aims at accurate centralisation of the nail, one feels that the calculation of small angles on wet films, and the setting of an instrument of this type must at some time or another lead to sufficient error to allow a nail to lie somewhat eccentrically. In such a case even although its alignment is perfect the sector of bone holding the nail in the head will be too small to overcome the danger of refracture.

Not only does one feel that such an apparatus may possibly lead to error, but the technique which I have developed for the insertion of the nail over a guide through an open incision has now become a matter of the greatest simplicity. It is an operation associated with very little shock and with the loss of only an ounce or two of blood; it can be completed in thirty to forty minutes, and I have now performed it in fifty cases including a high proportion of patients of 70 to 80 years of age suffering from chronic bronchitis, auricular fibrillation, prostatic enlargement, uræmia, pernicious anæmia and all of the diseases of old age, with a mortality of only 6 per cent. which is much lower than one used to accept as inevitable whatever treatment was adopted.

Some years ago one felt that a true subcutaneous insertion might be of value in a group of patients who could not withstand the shock of an ordinary operation, and Mr. Lloyd's suggestion falls very much closer to this ideal than the Svan Johannsen operation, which in fact is not a subcutaneous procedure at all. With the improvement in the technique of the open operation, however, I begin to doubt whether there is any scope for the subcutaneous insertion. In the last four years I have operated on 40 of the 46 cases I have seen; the remaining six cases were aged 80 to 92, and I feel that even a subcutaneous insertion would have proved too much for them.

One feels therefore that a blind instrumental insertion with its risk of imperfect and inaccurate centring and the delays and difficulties of X ray control in the operating theatre cannot compare with the 30-minute operation associated with so low a mortality in such an unpromising group of patients.

I am, Sir, yours faithfully,

Liverpool, July 22nd. R. WATSON JONES.

ARTIFICIAL RESPIRATION

To the Editor of THE LANCET

SIR,—Dr. Mijnlieff's article in your last issue, in which the Schäfer method of artificial respiration is depreciated, is one with which I believe that nearly all competent British and American authorities will disagree.

I have been a member of nearly all of the commissions and committees in America that have studied and reported on this subject during the past quarter of a century, and have been in close touch with the application and results of their investigations and reports. All have recommended the Schäfer method above all others for general use. How completely American opinion, supported by an enormous experience, is unanimous in support of the Schäfer method is indicated by the fact that more than 13,000,000 persons—police, firemen, coastguards, boy and girl scouts, school and college students and others—have been trained to administer this method, and no other is taught to them.

The advantages of the Schäfer method are indeed particularly great for the operator, both for immediate application and for prolonged maintainance. For the victim no method of manual artificial respiration can do more than to induce rhythmic expirations. This is true, as I know from my own investigations and experience, no matter how much the writers whom Dr. Mijnlieff quotes may claim the contrary. Active respiration cannot be induced by any form of manual manipulation. The inspirations that occur between the forced expirations are due solely to the tonic elasticity of the victim's own muscles—a topic that I have discussed in a paper appearing elsewhere (p. 178). In that respect the Schäfer method does at least as much as any other manual method if the arms of the victim are drawn forward and placed so that the head rests on one forearm.

For these reasons I beg to differ from the statement in your editorial that "Dr. Mijnlieff is able to make out a good case for preferring it [the Silvester method] to that of Schäfer."

The one method that may, perhaps, prove to have some advantages over Schäfer's is that recently described by Eve.[1] But as that method requires at least an extemporised see-saw, it falls perhaps somewhat outside of the topic of manual artificial respiration.

I am, Sir, yours faithfully,

London, July 20th. YANDELL HENDERSON.

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[1] Eve, F. C.: THE LANCET, 1932, ii., 995; Killick, E. M., and Eve, F. C.: Ibid., 1933, ii., 740.

VIRUS BODIES IN THE PERICARDIAL FLUID OF RHEUMATIC FEVER

To the Editor of THE LANCET

SIR,—The problem of the cause of rheumatic fever, reanimated in this country by the recent work on virus bodies is, we must all agree, of international importance. I think that in advancing any such study, the various views should be expressed, although in the spirit of progress and not of antagonism.

Dr. A. E. Coles, in your last issue, has added to the literature of the virus bodies in the pericardial fluid of rheumatic fever, and in his comment writes as follows: "From a clinical and pathological aspect both these diseases are more closely associated with a virus than a bacterial origin." He is alluding to rheumatic fever and rheumatoid arthritis.

This is one of those general statements easily accepted by many, and also important. Accordingly, having for many years at first hand studied the clinical and pathological aspects of acute rheumatism in childhood I venture to write this sentence: Acute rheumatism in childhood shows clinically and pathologically *its close association* with a bacterial origin. This does not exclude the possible importance of a virus. It may be—I do not know—that these virus bodies mark a further step in our knowledge of all infective processes, but that both clinically and pathologically acute rheumatism in childhood shows the *closest possible* association with a bacterial origin I have not the slightest doubt, and, further, continental and American investigators are numerous who would support this statement.

I am, Sir, yours faithfully,

July 20th. F. JOHN POYNTON.

THE MEDICAL DIRECTORY

To the Editor of THE LANCET

SIR,—To maintain the accuracy of our annual volume we rely upon the return of our schedule, which has been posted to each member of the medical profession. Should the schedule have been lost or mislaid we will gladly forward a duplicate upon request. The full names of the doctor should be sent for identification.

We are, Sir, yours faithfully,

J. and A. CHURCHILL, LTD.

40, Gloucester-place, Portman-square, London, W., July 15th.

BLEEDING OF TRANSFUSION DONORS

To the Editor of THE LANCET

SIR,—Dr. Shackle writes two days after the publication of our paper practically dismissing our method as unnecessary or useless. He has not thought it worth while fairly to try out the technique *as described* before rushing into print to condemn it. We would not have deemed this hasty criticism worthy of reply were it not for the fact that this is the second time we have suffered attack from Dr. Shackle in this way. In your issue of April 27th we published an article on "Continuous Drip Blood Transfusion." This also evoked from Dr. Shackle a letter of disparagement. On that occasion we forebore to reply hoping that readers would note Dr. Shackle's admission in his opening paragraph that he had no experience of what he criticised and find in it a measure for evaluating his observations. In his two letters he has found no single good word for either of our contributions. We would suggest to him that to publish destructive criticism of new methods without trial of them is as unfair as it is misleading. Criticism after reasonable test is legitimate and welcome.

We do not propose to meet Dr. Shackle's individua assertions with counter assertions: We would prefe to ask less biased readers to try the method fo themselves and then to judge our claims and Dr Shackle's criticisms. They will not achieve anything so astounding as "a stream of blood the size of a ordinary lead pencil," which Dr. Shackle obtains from a serum needle, and which seems to be a true instance of "yielding more blood than its lumen will carry." They will find, however, we think, that as a rule they can obtain a pint of blood inside five minutes with ease.

We are, Sir, yours faithfully,

H. L. MARRIOTT,
H. KEKWICK.

The Middlesex Hospital, London, W., July 21st.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

M.O.'S AND CIVIL HOSPITALS

By Order in Council of August 11th, 1903, candidates for commissions as medical officers in the Navy who, at the time of passing the qualifying examination for admission, hold or are about to hold posts as resident medical or surgical officer in a recognised civil hospital, may be allowed to serve in these appointments after the date of entry into the Royal Navy. By an Order in Council published in the *London Gazette* of July 19th, 1935, this provision is made applicable to candidates who enter the Naval Medical Service as surgeon lieutenants for short service. The time spent in the civil hospital appointment is to count for purposes of seniority, pay and promotion. and retired pay or gratuity on retirement, in the manner prescribed in the Order in Council dated June 29th, 1934.

Surg. Capts. E. Moxon-Browne to *Victory* for R. N.B.; and J. G. Danson to *Pembroke* for R.N. Hospl., Chatham.

Surg. Cmdrs. J. C. Brown to *Royal Sovereign* and to *Barham*; L. F. Strugnell to *Royal Sovereign*; J. Kirker to *Victory* for R.M. Infirmary, Portsmouth; H. E. Scargill to *Iron Duke*; A. de B. Joyce to *Victory* for R.N.B., and to *Excellent*; F. G. Hunt to *Glorious*; G. E. Heath to *Courageous*; and J. C. Kelly, D.S.C., to *President* for course.

Surg. Lt.-Comdrs. E. R. Sorley to *Victory* for R.N.B.; and J. Cussen to *President* for R.A.F. Medical Officers course; F. G. V. Scovell to *Pembroke* for Chatham Dockyard; F C. M. Bamford to *Pembroke* for R.N.B.; J. M. Sloane to *Drake* for R.N.B.; J. J. Keevil to *Victory* for Haslar Hospl.; W. R. S. Panckridge to *Nelson*; and A. D. Sinclair to *Cormorant* for Gibraltar Dockyard.

Surg. Lt.-Comdr. (D) T. Hunt to *St. Vincent*.

Surg. Lts. J. M. Holford to *Valiant*; and S. C. S. Cooke to *Deptford* on commg.; B. R. Alderson to *Glorious*; D. C. Robson to *Bridgewater*; S. J. van Pelt to *Royal Sovereign* and to *Barham*; M. Cay to *Royal Sovereign*; and E. B. Bradbury to *Endeavour*.

Surg. Lts. (D) F R. McN. Willis to *Drake* for R.N.B.; W. L. Mountain to *Royal Sovereign*; W. H. Foy to *Pembroke* for R.N. Hospl.; and E. F. St. J. Lyburn dna D. Simpson to *Australia*.

The following promotions have been made: Surg. Lt. E. H. Parkinson to be Surg. Lt.-Comdr.; Surg. Lt. (D) R. Symmons to be Surg. Lt.-Comdr. (D); and Proby. Surg. Sub.-Lt. K. E. O. Ringdahl to be Surg. Sub.-Lt.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. (D) R. Symmons to be Surg. Lt.-Comdr (*D*).

Surg. Lt. E. H. Parkinson to be Surg. Lt.-Comdr.

Proby. Surg Sub-Lt. K. E. O. Ringdahl to be Surg. Sub-Lt.

Surg. Lt.-Comdr. J. D. Simpson to *Excellent*.

Surg. Lt. D. R. Goodfellow transferred from *list* 1 to list 2 of the Mersey Div.

Surg. Sub-Lt. D. Shute promoted to Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Short Serv. Commissions.—Lt. W. T. Bermingham to be Capt.

L. C. Card to be Lt. (on prob.).

REGULAR ARMY RESERVE OF OFFICERS

The undermentioned having attained the age limit of liability to recall, cease to belong to the Res. of Off.:—

Lt.-Col. T. J. Wright, D.S.O.

Maj. R. B. Hole.

MILITIA

Maj. H. C. Bazett, O.B.E., retires on attaining the age limit, and retains the rank of Maj.

TERRITORIAL ARMY

Capt. W. C. Jack resigns his commn. on account of ill-health.

Supernumerary for service with the O.T.C.—Capt. W. M. Arnott, from R.A.M.C., Gen List, to be Capt.

Capt. J. J. D. Naismith to be Maj.

Lt. J. A. Blain to be Capt.

R. J. V. Battle and R. D. Burn to be Lts.

TERRITORIAL ARMY RESERVE OF OFFICERS

Capt. C. C. Taffs, from Active List, to be Capt.

ROYAL AIR FORCE

Wing Comdr. F. J. Murphy to R.A.F. Depot, Uxbridge, for duty as Senior Medical Officer and Officer Commanding R.A.F. Officers' Hospital, vice Wing Comdr. H. B. Porteous.

Wing Comdr. H. Burnet Porteous is placed on the retired list.

Flight Lt. A. S. Burns is placed on the retired list on account of ill-health.

Dental Branch.—Flying Off. H. M. G. Williams to Medical Training Depot, Halton, on appointment to a non-permanent commission.

Flight Lts. L. S. Everett, G. Gilchrist, and I. Mackay have been selected for permanent commissions in the Medical Branch, subject to physical fitness.

INDIAN MEDICAL SERVICE

Lt. (on prob.) J. F. A. Forster is restd. to the estabt.

The undermentioned appts. have been made in India:—

A.D.H.—Maj. E. W. Wade, D.S.O., R.A.M.C.

D.A.D.P.—Maj. H. J. Benstead, M.C., R.A.M.C.

The undermentioned officers have vacated appts. in India:—

D.A.D.P.—Maj. A. Mearns, R.A.M.C.

A.D.H.—Lt.Col. E. G. S. Cane, D.S.O., R.A.M.C.

PUBLIC HEALTH

A Salaried Service of Midwives

THE London County Council on Tuesday approved the proposal of the Joint Council on Midwifery to establish a salaried service of midwives. The report of the Joint Council had been forwarded to the L.C.C. by the Ministry of Health and had been considered by its hospitals and medical services committee. The Joint Council recommended in brief that the nursing of every maternity case should be conducted by a qualified midwife and that unqualified persons should no longer be permitted to nurse maternity cases for gain, it being laid on the local authority to provide midwives to act as maternity nurses for parturient women under a doctor's care unable to afford a trained attendant. The Joint Council proposed that a salaried service should be established under the local supervising authority (Midwives Acts) in all areas not already served by salaried midwives but without interfering with the continuance in practice of independent midwives. The Joint Council further proposed that midwives not accepted for salaried service or unfitted by age or infirmity should be entitled to compensation or pension. The L.C.C. supported the recommendation to establish such a service but, on behalf of the hospitals committee, Dr. Somerville Hastings was unable to accept the principle of compensating inefficient midwives. In the course of the debate Dr. Barrie Lambert stated that the present service was better than that of ten years ago by probably at least 50 per cent. although this improvement in the service was not reflected in any improvement in the mortality of childbirth. An amendment to ask the Ministry of Health to formulate a complete scheme for better organisation of maternity service in London was defeated. Sir Kingsley Wood told a deputation on Tuesday (p. 231) that he was awaiting the views of the L.C.C. and other local authorities before acting. It may well be he will take a more generous view in the matter of compensation, for without this it seems unlikely that any scheme will prove acceptable to organised midwives.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 13TH, 1935

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 0; scarlet fever, 1461; diphtheria, 910; enteric fever, 49; acute pneumonia (primary or influenzal), 393; puerperal fever, 33; puerperal pyrexia, 102; cerebro-spinal fever, 22; acute poliomyelitis, 8; acute polio-encephalitis, 4; encephalitis lethargica, 5; dysentery, 7; ophthalmia neonatorum, 85. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 19th was 2661, which included: Scarlet fever, 747: diphtheria, 964; measles, 40: whooping-cough, 417; puerperal fever, 26 mothers (plus 7 babies); encephalitis lethargica, 270; poliomyelitis, 1. At St. Margaret's Hospital there were 26 babies (plus 14 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns including London, there were no deaths from small-pox or enteric fever, 17 (1) from measles, 5 (1) from scarlet fever, 14 (5) from whooping-cough, 30 (1) from diphtheria, 50 (8) from diarrhœa and enteritis under two years, and 19 (3) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 7 deaths from diarrhœa, Hull and Birmingham each 3, no other town more than 2. Of the fatal cases of measles 4 occurred at Liverpool, 3 at Birmingham. Four deaths from diphtheria were reported from Liverpool, 3 each from Reading, Leeds and Birmingham. Leeds also reported 3 deaths from whooping-cough.

The number of stillbirths notified during the week was 300 (corresponding to a rate of 42 per thousand total births), including 45 in London.

AWARD TO DR. W. H. PARK.—Prof. Park, director of the bureau of laboratories of the New York City Health Department since 1894, has been selected as recipient of the Theodore Roosevelt medal for 1935, awarded for distinguished service in the administration of public office. He was the first to introduce diphtheria antitoxin into the United States and to make it available to the public, and he has been a pioneer in the discovery of the part played by carriers in the spread of infectious disease.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

PUBLIC HEALTH SERVICES

Sir Kingsley Wood's Review

On July 17th, in Committee of Supply on the Civil Estimates, **SIR KINGSLEY WOOD**, Minister of Health, sought approval for a total net estimate of £20,102,000, an increase of £313,000 on last year. A great part of the increase was, he said, due to the steady increase in housing grants, owing to the increased activities of local authorities on slum clearance; the remainder to the cost of the extra staff required in connection with slum clearance, &c., and to provision for restoration of salary cuts made in 1931. He went on to review briefly some of the main developments in health affairs of the last 25 years.

The great thing to note, he said, had been the awakening of the national conscience on health and housing affairs. There had undoubtedly been a widening of human compassion and the coöperative spirit. The nation itself had learned in many ways the supreme art of right living. Greater common sense was being shown in health matters, in clothing, dietary, and in the increasing use of daylight, open air, leisure and recreation, with the result that to many people in this country life was becoming longer and better—the greatest gift that civilisation could give. In 1910, for instance, the death-rate for all ages in England and Wales was 13·5 per thousand persons and 95,000 infants died under one year of age. Last year the total death-rate had fallen to 11·8, and the loss of infant lives under one year of age was reduced to 35,000, the lowest infant mortality rate on record. It was estimated that when Queen Victoria came to the throne the English boy child at birth had an expectation of 40 years of life. In the eighties it had risen to 44, and in 1910 to 51. In 1932, a generation later, it was 59. The growth of knowledge in medicine and surgery through all that period had been continuous. Typhoid fever, for instance, had been brought under control; it was at one time the scourge of nations and armies. The discovery of insulin in 1922 had revolutionised the treatment of diabetes. Orthopædic surgery was preventing the onset of crippling and treating cripples with new knowledge and by new methods. But cancer, still accounted for some 60,000 deaths last year, and a less malignant enemy, though regarded by many as Public Health Enemy No. 1, was the common cold.

The creation of the scheme of national health insurance had been one of the most remarkable developments in public health. The value of the benefits disbursed since 1911 was £480,000,000. In the last 10 years, over £150,000,000 had been disbursed on the statutory sickness and maternity benefits and over £90,000,000 in medical benefits. The scheme had survived the strains of the War, and the prolonged depression and unemployment of recent years. It was true that it had been found necessary to underpin the scheme, and to take steps to preserve its actuarial solvency. But it had stood the test of three valuations and it had been found practicable to allot £53,000,000 in additional benefits. Our national insurance system had now been adopted by 12 other countries from Norway in the north to Japan in the east.

But there was the unsolved problem of the unreduced maternal mortality rate. Its solution would require patience, constant research and active endeavour. The Departmental Committee which reported in 1932 suggested that at least one-half of the deaths might be prevented. The rate varied remarkably as between one area in the country and another. In West Ham, a poor borough, with a population of over 280,000, the maternal mortality rate over the period 1924/33 was 2·48 per 1,000 births. In Nottingham, a borough better off in many respects, and with practically the same population, it was 3·74. In Westminster, it was 5·63; in Marylebone 3·78; in Kensington 3·51; in Hampstead 3·48; and in Poplar 2·63. There had been no relaxation in the maternity and child welfare services on financial or other grounds. The number of visits paid by health visitors to expectant mothers showed an increase of 60,000, 240 more ante-natal clinics were provided and the number of women who attended those clinics rose by 49,000. The total number of attendances rose by 242,000, and the total number of women admitted to maternity beds in institutions provided or subsidised by local authorities rose by 29,000. They must, he added, go on vigorously with this work. They must persevere in the investigation of the causation of maternal mortality. He attached great importance to the midwifery service. Midwives attended approximately 60 per cent. of the confinements in this country, but their remuneration was low, and the poor pay and prospects reacted on the quality of entrants.

Sir **KINGSLEY** concluded with a summary of progress in rehousing the nation. There had been a record progress in the clearance of the slums. For the first six months of 1935, new houses for slum replacement had been sanctioned at the rate of over 6,000 a month in England and Wales, and at the end of June nearly 100,000 houses had been approved for this purpose, of which some 50,000, sufficient for about 240,000 persons, had already been completed. This was a great beginning of better things, especially when it was remembered that during the years 1875 to 1933, only 200,000 persons living in slum houses had been rehoused. There was further work still for the local authorities in the construction of new dwellings for families living in overcrowded conditions, in accordance with the proposals now before Parliament which he hoped would shortly be on the Statute Book.

VIEWS AND CRITICISMS

Mr. **GREENWOOD** said that, while it was true that there had been a very substantial improvement in the standard of the health of the people, he was surprised that no reference had been made to the question of malnutrition. Malnutrition was one of those subtle and creeping diseases the effects of which were not immediately seen, but from which a subsequent generation might seriously suffer. The houses built during the last four years would not, he said, bear comparison as regarded standards with the houses that were built before.

Mr. **JANNER** said that, although public attention must needs be drawn to the serious problem of maternal mortality, it was extremely important that the impression should not be created that child-bearing in itself was dangerous. The Departmental Committee on maternal mortality stated categorically that half the deaths in childbirth could have been prevented had a reasonable degree of skill been brought to bear upon the management of the cases, and adequate facilities for treatment been provided and utilised. Was the Minister satisfied, he asked, that the maternity and child welfare authorities were dealing actively and thoroughly with the position, and that the 174 who reported that they did not propose improvements were justified in their attitude, seeing that the mortality rates were so high? There was a strong feeling that post-graduate courses should be generally provided for practising midwives, that the salaries of midwives should be very much higher, and that midwives in rural areas should be subsidised and their numbers increased, so that they were more readily available and did not have to travel great distances. There was also a strong feeling that a doctor should be employed in every case, even though there might not be complications in the first instance, so that the doctor might be available in the event of any complication arising; and that obstetrical specialists should be available for all pregnant women. Mr.

Janner quoted Dr. Veitch Clark's view that midwives should form part of the externe practice of the maternity units of hospitals. They should be afforded the opportunity of living in a hostel or a home, should have an income guaranteed to reach a certain level by the local authority, and be linked up with ante-natal and post-natal clinics, and the hospital. During the last four years, there had been in Manchester a four-fold increase in ante-natal work; 50 per cent. of the pregnant women were now being seen ante-natally by the public medical service, and this increase in supervision had coincided with a fall in the death-rate from puerperal sepsis from 1·7 to 1 per 1,000. Mr. Janner asked the Ministry to urge local authorities to provide obstetricians who, day by day, would deal with cases definitely from the stand-point of a specialist. Full-time clinic officers should be appointed in as many instances as possible, and adequate hospital accommodation provided to enable them to follow each case when the actual time of confinement came.

Sir Francis Fremantle paid tribute to the work inaugurated by Sir George Newman; he welcomed the new chief medical officer, and asked for an assurance that his status remained unimpaired as a secretary to the Ministry of Health, with direct access to the Minister. During the past 25 years, he said, there had been a great change in the understanding of infectious diseases. In order to exterminate the microbe, they had isolated the patient, until it was shown that the same germ might exist in healthy carriers, and that at one time a microbe did not seem to do any harm and at another was brought suddenly into activity by a cold, a chill or an injury. It was the soil and the variations in the soil that mattered. What they had to do was to aim constantly at improving the physique and the health of the individuals that made up the population. The Ministry of Health, through the local authorities, had various means in which the promotion of physical health could be assisted, and he hoped the process would be continued now through the whole machinery of public health. They must recognise, too, that shortage of nutrition, more particularly among mothers, was bound to affect the next generation. Happily, there was little evidence of any increase of ill-health, either mortality or infectious sickness, from medical inspection in the schools in the depressed areas. There was malnutrition in particular families and districts where less attention was paid to the preparation of food. That was a point he hoped the Ministry would pursue with the Board of Education. More important than the selection of proper food was the power to cook it properly; a generation had grown up entirely ignorant of the art of cooking. To deal with maternal mortality, legislation, he said, would be required. The profession of the midwife must be made really attractive as a profession to the kind of girl that they wanted to have for this important service. He described the Rochdale experiment where, in the years 1932 to 1934, an intensive campaign had reduced the rate from 10 per thousand to 3·9. The same thing was repeated in the Rhondda Valley, where a special campaign, begun 18 months ago, had reduced maternal mortality to a third by paying attention to what everyone ought to pay attention to in the matter of confinements. Results could often be obtained by using existing machinery, but they had to bring machinery and an elastic mind together.

Mr. West called attention to the borough of Kensington where the infantile mortality last year was 93 per 1000, which was 50 per cent. worse than the average for London. The death-rate in North Kensington was 102 per 1000 compared with the rate in one East End borough of not more than 60 per 1000, in Poplar of 62 per 1000 and in Hackney of 54 per 1000. For the last ten years the death-rate in North Kensington and Kensington had been enormously above the average rate for Great Britain. There were one or two wards in Kensington which had a death-rate last year of 120 per 1000. If he had time he could show that not only the infantile death-rate but the diseases rate in respect of tuberculosis, fever, diphtheria and pneumonia averaged from three to four times that for London. Let the Government, he said, put some ginger into the councils who would not do their duty.

Mr. Levy appealed to the Minister of Health to see that the water supplies of the country were improved.

Dr. Addison said he was greatly comforted to hear the Minister say that he would take active steps to combat maternal mortality. They all knew that the training of midwives and so forth would take time, but by a few years of active work he believed that Sir K. Wood or his successor would be able to bring down the maternity death-rate. But he wanted to call attention to a matter of first-rate national importance. In the report on the school services in 1933 the concluding sentence ran:—

> "The physiological deterioration of the unemployed may appear at any time although it has not yet in any general degree appeared."

Dr. Addison believed that dramatic evidence of this physical deterioration was now emerging. He agreed that this deterioration was difficult to define; at the same time malnutrition began to appear gradually among children in the pre-school years, so that when old enough to go to school one began to find something distinctive in their condition. He said:

> The medical officer for Breconshire examined 2000 children in 15 schools in July, 1934, and he found that the "under-weights"—children of five classified as being under-weight from depressed areas—numbered half as many again as those from the areas which were not regarded as depressed. In Burnley the medical officer reported that the percentage of malnutrition among children had risen from 1·4 per 1000 in 1929 to 8·3 in 1933, notwithstanding the provision of free meals.
>
> The report of the Preston medical officer contained this:
>
> "Put scientifically, the industrial situation has deprived people of first-class proteins, fats and vitamins. In plain words, bread, jam, margarine and tea have taken the place of milk, meat, eggs and fresh fruit. In the districts where unemployment is most marked the results of poverty are very definitely reflected in every class of the school. Taken as a group the children are undersized, pale, listless, flabby and mentally dull."
>
> In Pontypridd the medical officer's report stated:
>
> "Long-continued unemployment in the basic trades has led to a large number of families becoming dependent upon transitional payments or public assistance. There is imminent danger of this continued low level of subsistence leading to malnutrition and physical deterioration among the children of the unemployed."

These were a fair sample of the reports which had emerged in the last 12 months or so when there had been time for the malnutrition associated with unemployment to begin to make itself manifest. He would urge that the report of the President of the Royal Society and other scientists that was made to the Government last year on the nutrition of children and kindred subjects should be published.

A most precise inquiry had been conducted at Newcastle among the children of those who had been out of work and of those who were more well-to-do.

> Among the well-to-do 25 per cent. of the children were above the normal height, whereas in the industrial or poorer classes only 2 per cent. were above, and 47 per cent. were below it. A remarkable thing had emerged during the last two or three years from these nutritional inquiries in the poorer areas, and that was the wide extent of anæmia among children. It arose only gradually and imperceptibly, gradually developing as a result of improper or insufficient dietary. In the Newcastle case a certain standard was taken. Twenty-three per cent. of the industrial classes and those who had been unemployed were below a very low standard. None of the other children were below and 75 per cent. of them were above it. In this inquiry, Dr. Spencer first came across these children by accident, because he was looking out for cases of rickets to treat

with the modification of a new scientific remedy. In 1921 and 1923 it was very difficult in hospital out-patient rooms to find rickets; but in Newcastle 44 cases of rickets were found quite easily. In the first 40 cases, as they came in, when their family circumstances were traced back, in every case the parents were out of work. Cases throughout the country which had been investigated all indicated the same kind of thing, that about 60 per cent. of the expenditure on food of the poorer people was spent on cereals, bread and so on, which did not contain certain elements necessary for full healthy development, and the absence of which explained rickets, dental caries, pyorrhœa, and so on to a large extent. These people could not afford eggs, milk, fresh fruit and vegetables.

If, said Dr. Addison, the feeding of the unemployed and the allowances to be made by the new Board were accompanied by a proper diet policy, he would undertake to say that in a few years' time the average stature of British children would be up by, say, a couple of inches, and they could wipe out rickets together with 50 per cent. of the dental caries and pyorrhœa.

Mrs. TATE said the spending of money alone would never save one mother's life in the country. The maternity mortality problem was not as simple as that. Medical knowledge had advanced out of proportion to the availability of that knowledge to the public, which would come when they had a proper coördination of services, proper continuity of services, and, above all, proper training. In the area served by Guy's Hospital the maternal mortality figures had been brought down to one per thousand because there was a trained staff attending the people. The position in the country to-day was the danger of a less trained staff. Even Guy's students and midwives were getting only half the material on which to learn laid down as a minimum by the General Medical Council. Ante-natal and post-natal clinics were useless unless staffed by experts. One of the main faults lay with the appointment boards of hospitals which insisted before they gave good jobs to nurses that they should have a C.M.B. certificate, whether or not they intended to practise midwifery. If the small supply of material was used by nurses who were never going to practise midwifery it meant taking it from those who were. Mrs. Tate referred to the report of the Committee on Fractures, which showed a complete lack of organisation in this country in regard to fractures in almost all the general hospitals, with serious loss of money not only to the workmen themselves, but to the insurance companies. There were two well-organised hospitals for fractures in this country: Ancoats Hospital, in Manchester, and the Liverpool Infirmary. To quote only one example: in 482 cases of Colles's fracture in organised hospitals the disability period averaged seven weeks, and the number of cases permanently incapacitated was two. In unorganised hospitals, in 38 cases of the same fracture, the average period of disability was twenty-nine weeks, and the number of cases permanently incapacitated was nine. Those figures gave serious cause for thought. She hoped pressure would be brought through the Ministry and the insurance companies to see that a continuous and efficient service for accidents was inaugurated. One of the causes of ill-health among women in the urban and industrial areas was, said Mrs. Tate, the tremendous amount of abortion. Hon. members might or might not approve of birth control clinics, but let them face what was going on.

Viscountess ASTOR said the fall in the birth-rate meant that they had to take particular care of the children that were born. About 80,000 children were born each year, and of that number 2500 were still-born, 2700 died under the age of 1 year, 6700 died between the ages of 1 and 2, and 6600 died between 1 and 5. Those figures were too high. It was in this connexion that the infant welfare centres were so important, but although this country was ahead of nearly every other country in the world in that respect it had not enough infant welfare centres. There were 1,750,000 children between the ages of 2 and 5, and of that number 200,000 lived in overcrowded conditions of 3 or more persons per room. Out of every 100 school-children examined 15·9 needed medical attention, 15·4 needed observation, nearly half showed rickets. They must increase the number of infant welfare centres and open-air nursery schools. They must face the fact that a high percentage of maternal mortality was due to attempted abortion. There was only one ante-natal clinic for every 5500 women of child-bearing age, and some of these clinics were not properly distributed. How many local authorities were prepared to make any provision for scientific birth control? Ignorance was the chief cause of the practice of abortion. Women were unable to get advice. Local authorities had been allowed to give such advice since 1934, but of the 1200 local authorities only 60 had clinics, though it was true that about 150 more referred patients to voluntary agencies and there were 54 voluntary clinics in England and Wales. A great deal of suffering could be prevented.

Mr. BATEY referred to a letter of Dr. G. F. Walker, of Sunderland, to the *Times* of Dec. 11th, 1934, which led to an enquiry by the Ministry of Health. By far the worst part of the County of Durham referred to in Dr. Walker's statement was the south-west, but no enquiry was held there into the alleged malnutrition and deterioration. There was no doubt in his mind that in that county at the present time thousands, including children, were suffering from under-nourishment. He urged a fresh enquiry.

Dr. HOWITT called attention to the work done by the almoners attached to hospitals. There were at present, he said, many people who called themselves almoners, and who did excellent work but were not trained almoners as he would wish them to be. In hospitals to-day, as far as he knew, there was nobody who had a true knowledge of all that could be done for a patient. In these days they must have expert knowledge of all the charitable help and government help open to a patient. So far as he knew, no man or woman on the staff of a hospital had that knowledge to-day. Neither had any of the hospital officers. To ensure that hospital almoners should be able to see that there was no waste in hospitals, the Institute of Hospital Almoners selected the right type of person to be almoners. These persons had to obtain a diploma of Social Science, which meant two years' work and the passing of examinations, say at the School of Economics. They then had to work for four months in a charity organisation society and subsequently for ten months in a hospital almoner's office. After a training lasting a little over three years such a woman, who to start with must be well-educated, had really an idea how she could do scientific social service. Dr. Howitt instanced the value of hospital almoners in obtaining charitable or governmental assistance for patients who would not otherwise be able to carry out the medical or surgical advice given them by the hospital staff. In cases of tuberculosis, he said, it was essential that the relatives of a patient should be brought to the hospital in order to ascertain whether they had contracted the same disease. The almoner brought all these contact cases to the hospital to be examined, and she also saw that the home was made fit for persons who were subject to tuberculosis to be properly looked after. He hoped the Ministry would see that all hospitals in this country had properly qualified almoners attached to them.

Dr. O'DONOVAN said he had a familiar working knowledge of the poor, and he had never got the impression that either the poor or the rich had, since the War, been unfamiliar with birth control knowledge. The supply of birth control goods and apparatus was a competitive and big business. To suggest that abortion was practised, leading to the frequent death of women, and this through lack of birth control knowledge, was in his opinion a misreading of the facts as they were. There was to-day a tremendous propaganda to the effect that marriage need not be associated with the production of children, and once that idea became bitten into the public mind there was a demand that contraceptive practice should be efficient. The demand for efficiency became almost a passion, and if birth control through contraceptive practice failed, then the woman who found herself pregnant demanded that abortion should complete what birth control had failed to do. The one grew out of the other; and when they added to that, through the same advocates, the policy of sterilisation they had a trilogy of birth control, abortion, and sterilisation which, if imposed on an unwilling Ministry, would turn it from a Ministry of Health to a Ministry of Death.

Lieut. Col. MOORE said there were very few plastic surgeons, and they were overwhelmed by demands upon their skill and service. Why should they not devote some of the resources at the disposal of the Ministry to assist in the formation of a special hospital where people disfigured by nature or by accident could find treatment. He suggested this should be done in conjunction with the L.C.C., and other county hospitals.

Mr. STOREY suggested to the Minister of Health, that the time was ripe for an inquiry into the whole hospital system of the country, so as to provide a coördinated plan.

MINISTERIAL REPLY

Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, said he wished an occasion would arise when the sterilisation of the unfit could be more freely ventilated. They wanted the guidance of public opinion. The policy of the Ministry of Health was that it was wrong for a maternity and child welfare centre, or a clinic for the treatment of sick persons, paid for out of public funds, to be used for giving contraceptive advice, except in cases where further pregnancy would be injurious to health. In reply to Sir F. Fremantle he said that the chief medical officer of the Ministry would have the status of a Secretary in the same degree as his predecessor, and the same right of direct access to the Minister. With regard to the points raised by Mr. West about infantile mortality in Kensington, he had in his hand a letter from the medical officer of health which showed how careful one ought to be in quoting statistics.

In one divison of Kensington—Holland Ward—there was an infantile mortality rate of 133 per thousand. That was very high, and was accounted for by the fact that there were 18 deaths. The letter from the medical officer showed conclusively that of these 18 deaths only 3 could have benefited by the maternity and child welfare services, and that, in fact, only 3 availed themselves of them. Of the 18 deaths, a considerable number were of children who had been adopted by institutions in Kensington; they came from outside. He had not the slightest doubt that much of the high rate in Kensington was due to bad housing conditions, but the housing problem was being tackled there as vigorously as in any other London borough.

Mr. Shakespeare challenged the suggestion of Dr. Addison that the Government had economised on the care for children and mothers during the last four years. In every circular that they had issued they had made it plain that although economy was necessary in 1931 the work of maternity and child welfare centres must be pressed forward. Dr. Addison had also asked that the Government should publish the report of the Economic Advisory Committee. This was a confidential report to the Cabinet. If published, the whole purpose of the Committee and the value of their reports would be lost. As a result of the last report the Government had enlarged the Advisory Committee on Nutrition set up a few years ago and turned it into a Standing Committee, under the chairmanship of Lord Luke, consisting of expert dieticians, statisticians, medical men and people with a great knowledge of public health and social conditions. The question of nutrition had hardly been touched. One would expect that with continued and prolonged unemployment there would be a slow deterioration of health, and the Ministry were always looking for that. Mr. Batey had raised the question of the report of the inquiry on Dr. Walker's statement about conditions in Durham. Dr. Walker was associated with that report, and if he asked the investigator to go anywhere he went, and this was what the report said:—

> "While we have found in the area under review a considerable incidence of sub-normal nutrition and some incidence of malnutrition, our investigation shows little evidence of any increase of disease and none of increased mortality. The physical condition of the majority of individuals passed under review is good. Realising the long-continued economic stress to which this population has been subjected and with knowledge of the home conditions of many we have often been surprised at the high standard of health and courage which has been maintained."

The report did show that the condition of adolescents from 14 to 16 was far from satisfactory, and the Government took steps to rectify it. They instructed the local authorities to pay special attention to giving relief to families containing adolescents. When a person was malnourished very often it did not mean that more food would rectify it; more food might accentuate the digestive disturbance. What was wanted was advice and instruction so as to secure that the right food was taken and that it was properly cooked. Mr. Shakespeare quoted an experiment recently conducted in London. Dr. Simpson in 1934 examined the condition of children in some of the poorer areas in London. He took a sample of malnourished children and he found that 7 per cent. of a certain batch came from the homes of the unemployed and in another area, another school, he found that another 7 per cent. of malnourished children all came from homes where the means were substantial and the parents were employed. What was vital was that the Ministry should be constantly on its guard. Whenever they received reports from medical officers of health or any signs of malnutrition they immediately got into touch with local authorities. The machinery of public health in this country, both national and local, had so far proved adequate.

Work of Home Office: Factory Accidents and Industrial Diseases

ON July 16th, the House of Commons went into Committee of Supply on the Civil Estimates. CAPTAIN BOURNE was in the chair.

On a vote of £396,253 to complete the sum necessary for the salaries and expenses for the Home Office, SIR JOHN SIMON, Home Secretary, recalled that just 20 years ago he was Home Secretary. Since then there had been great extensions in the work of the Home Office, for example, in the control over dangerous drugs.

Referring to the annual report of the chief inspector of factories for 1934, he called attention to the excessive number of accidents among juveniles, though happily the fatality-rate was low throughout the whole of industry. The chief inspector pointed out that the true solution lay in voluntary efforts of employers and others, and in the better training and supervision of boys and girls in the early days of their employment. SIR JOHN had sent to the National Confederation of Employers' Organisations, inviting them to a conference with the department on this subject. The report of the chief inspector also illustrated the fact that since the war the work of the factory department had developed in several new directions.

Mr. RHYS DAVIES moved the reduction of the vote by £100. He asked the Home Secretary to investigate the problem of whipping boys by the order of the court; he hoped the department would continue to discourage the practice. The worst feature of the annual report referred to was the increase of reported accidents from 113,260 in 1933 to 136,858 in 1934, roughly an increase of 5,600, fatal accidents having increased by nearly 100—i.e., from 688 to 785. The percentage increase of reported accidents was far higher than the percentage increase in the number of work people employed.

Industrial diseases also were for the most part increasing; 30 more new cases of lead poisoning occurred than during the previous year and six more deaths. Even in the painting of buildings there was an increase in lead poisoning, in spite of the passing of an Act of Parliament a few years ago, dealing with the use of white lead in paint. The most extraordinary anomaly of all was that while safety organisation in factories was growing there was almost a proportionate increase in industrial diseases and accidents. The only redeeming feature was the declining rate of silicosis in the pottery industry. There was also a serious increase in industrial disease among those employed in chromium plating and those handling pitch, tar, and oil; 423 persons had died from pitch and kindred cancers from 1920 to 1924.

Mr. PIKE asked if Mr. DAVIES would say what was the cause of the increase in the chromium plating figures?

Mr. DAVIES replied that medical men were, he believed, inquiring into this question. Cases due to fuels and gases were 179 in 1934, compared with 149 in 1933, with 21 deaths in 1934 against 14 in 1933. Negotiations had been proceeding for some time past between the Home Office and the employers in the Lancashire textile industry, regarding men who suffered from asthma and bronchitis consequent upon dust in card rooms. He believed that the Home Office had been doing its best. It was very difficult to schedule this disease for workmen's compensation. He welcomed the efforts to secure better lighting in factories. If the Home Office could not by ordinary pressure bring the factory owners up to standard in this connexion, he hoped that they would ask for Parliamentary powers to deal with them.

Referring to the circular issued to local authorities preparing the population for an attack from the air, he said he doubted if a circular so awful in its implications had ever been issued by a Government department in this country. Mr. DAVIES knew of no device which would effectively safeguard human life once aircraft began to drop bombs on a civil population. The clamour for gas masks following an issue of the circular would lead to the same problem of profiteering in gas masks as they had had in the manufacture of aircraft, unless the Government took immediate steps to prevent it.

Mr. PIKE said that Mr. DAVIES had failed to read the significant part of the report concerning lead poisoning. The sentence read: "The reduction in cases of lead poisoning in the past few years has not been maintained; there is an increase of 30 over last year's figures, mostly among pottery workers, as foreshadowed in the annual report of 1933." The chief inspector attributed this increase mainly to the increase in the building of houses and in some measure to an influx into the industry of untrained workers, under the supervision of persons not yet fully alive to the high standard of cleanliness required under the regulations to control the lead risk. It was stated in the report also that of the 26 cases in the pottery industry, 16 occurred in the manufacture of highly decorated tiles with leaded glaze, which carried less liability to silicosis but more to lead poisoning than did the manufacture of other tiles.

Similarly the report stated that the increase in the number of cases of chrome ulceration was attributable to the further extended use of the process of chromium plating.

Mr. TINKER said that the Home Secretary had power by regulation to include in the schedule of industrial diseases any disease which he thought should be brought into the schedule. Workmen's compensation had been built up by that method. Many members, especially those who represented industrial areas, had come across cases of Dupuytren's contraction, which seemed to be brought about by the thickening of the tissues in the centre of the hand, origin by excessive use of a spade or pick. One man sent him a letter over 12 months ago now had h in an advanced state of contraction, and in a m or two he would have to give up work. There nothing in the Workmen's Compensation Ac protect him. His medical man told him that he entitled to compensation because his condition been brought about by his employment, and the went to his trade union official. They looked up schedule of diseases, but the term was not include it, and the man could not get compensation. Home Office declared that there was not suffic evidence to warrant the inclusion of the disease. hoped that the new Minister would not let the ma stop at that.

Another question was that of medical refe When a man was regarded as recovering, the empl had to examine him, and if the man was well on way to recovery he could serve him with ten d notice. The man could get a medical opinion, w might be that he was not recovering. The ma was then referred to a medical referee. It pas through the register of the county court, and at end of ten days came before a medical referee examination. He had no fault to find with the met up to that point; his complaint was in regard to length of time, sometimes one, two, or three mon that elapsed after the ten days before the man examined by the medical referee. After such a l period much if not all of the damage might h passed away, and in that case the man would nothing. That gave rise to difficulties in signing at the Employment Exchange, because the man not fit for work and could not claim unemploym benefit. When he was fit for work he received compensation and no unemployment benefit.

Could not the Home Office lay it down that at end of ten days the man should be paid his comp sation until he went before the medical refere That would certainly hurry matters up. Or could th not say that at the end of a reasonable time, say a fo night, if the man had not then been before the medic referee, owing to the fault of the employer, comp sation should be paid to him until he did go before t medical referee? If that could be done, these ca would come before the medical referee with extre rapidity.

At present, there was only one medical referee, w alone had the power to decide a man's fate, and ev though his condition might change from what it w when he came before the medical referee, the man h really no case in law. He could go before the coun court judge, who could hold that there had been change in his condition. The Miner's Federati took such a serious view of this matter that they ha asked the Home Office whether, at least in extren cases, there could not be more than one medical refer to decide on the condition of the man.

Sir ARNOLD WILSON drew attention to the i creasing frequency of accidents in electrical lifts large towns; he held that these should be notifie Hundreds of people—mostly boys—were killed maimed in our cities every year by lift acciden The lift was becoming more and more a p of our lives, and it was not safe to leave the matt any longer to chance and the coroner. The ch inspector of factories had referred to the bad lighti which was so common in factories. Instead appointing more factory inspectors and devisi fresh laws and regulations, the Home Secretary shou induce the great firms in this country who suppli electrical equipment to spend a few thousand poun on a special campaign of advertisement and educati and instruction, particularly of small firms, into t numerous new ways of lighting which could be intr duced, often at a great saving, even into the olde factory. He endorsed Mr. TINKER's plea in rega to the subject of a medical referee sitting alone. Le poisoning and chrome ulceration were largely due the absence of adequate medical supervision on t spot at the right moment, as was stated by the chi inspector of factories. The doctor was coming more and more into our lives and his position in such matters should be that of an assessor or witness, who should give his technical advice, and the final decision whether a man was or was not suffering from a given disease—a matter upon which his whole future depended—should be given by a judicial authority, a referee—someone learned in the law—who had to assist him, on the question of evidence, one or more medical men of high repute sitting as assessors, and not acting as judges. Dupuytren's contraction was an admittedly obscure disease and he could quite understand the difficulty of the Home Secretary's predecessor in reaching a decision that this was a proper disease to schedule, but he could see no reason why, with the Industrial Health Research Board at the disposal of the Home Office, every single reported case of that disease should not be specifically examined by a doctor appointed by the Board. If this disease was thoroughly examined a final decision could be reached within a year or so, and once reached could be given retrospective effect. We had mighty efficient scientific machinery, and he was by no means satisfied that we were making the best possible use of it.

Sir A. Wilson had not seen a copy of the air raid circular, but he felt confident that there was far less known about the probable effect of many of these terrible weapons than was popularly thought. He believed that the best remedy was attack, but that was obviously outside the Home Office vote. Meantime, he urged the Home Secretary in any public references not to increase the public fears.

Mr. Lyons pointed out that incidental risk was attached to various new kinds of work. For example, chromium plating was now so much used that manufacturers on a large scale no longer bought their chromium-plated material and put it on to their own article, but established their own chromium plating plants. That new type of work offered a new danger to employees. He welcomed the suggestion that proper medical inspection and constant medical guidance could prevent increased accidents. He suggested to the Home Office that any concern utilising a new type of invention, such as chromium plating, should be specifically asked not to wait for fortnightly or monthly inspections, but to make the period very much shorter, and to introduce medical supervision daily, if necessary. Finally, he asked the Home Secretary if the time was not now ripe for a real review of the schedule of industrial diseases.

Mr. Fleming called attention to the provisions of the Drugs Act of 1920. The Department, he said, had been pressed from all quarters to tighten up the administration, and there had been a report from the Poisons Board with regard to the people who should be qualified and permitted to dispense drugs. While protecting the public as far as possible, the Home Office ought to take the greatest care to see that, if it acted upon that report, it did not cause undue unemployment. If the only people allowed to supervise the manufacture of poisons to be used medicinally in this country were members of the Institute of Chemistry, men and women more qualified than members of this institution would be debarred from doing the work which they were doing to-day.

Mr. Cleary said that the Mersey Tunnel was 2½ miles long, and there was a widespread opinion that tunnels of such great length and holding capacity would provide safe refuges in an air raid. On the other hand, if poison gases heavier than air were used, these tunnels would become death traps. Referring to the Poisons Board, if members of the Institute of Chemistry alone were to have any voice or control in the manufacture of poisons this would exclude 60 per cent. of the chemical profession, including the members of the British Association of Chemists, and this would obviously be an injustice and a hardship.

Mr. John emphasised the need of expanding the schedule of industrial diseases. The last 30 years had shown that from time to time new diseases were discovered, consequent upon changes in occupations, which were not scheduled under the Compensation Act. Experience had proved the need not only of expanding the schedule, but of revising some of the orders already in existence. Great progress had been made with respect to orders dealing with silicosis during the past 15 years, and last year's order was a material advance. It provided that a workman certified as suffering from silicosis was entitled to compensation, but there were two or three difficulties. One was that the order was not retrospective. Hundreds of men who had been certified as suffering from silicosis, could not establish their claims, merely because they were suffering from silicosis prior to the date mentioned in the order, namely, October, 1934. The order was confined to underground operations, and the large number of surface men certified as suffering from silicosis could not claim compensation. No matter when or where a man contracted the disease such certification ought to entitle him to compensation.

Then there was the question of aggravation and acceleration. If a man died following an accident, and the doctor certified that the accident had aggravated death, the widow and orphans were entitled to compensation; but if he died of heart failure or pneumonia, notwithstanding the fact that the doctor certified that silicosis had aggravated or accelerated death, the widow and orphans were not entitled to compensation. A disease similar to silicosis was anthracosis. It was getting very prevalent in the coalfields, and medical science through the College of Physicians was taking a keen interest in it. It had been found that a large number of men were suffering from anthracosis, which was contracted through the inhalation of coal dust. In years gone by, it was certified as bronchitis. He asked the Home Secretary to make investigations to ascertain to what extent this disease existed in the coalfields, and to see whether it was possible without much delay to make an order to enable a man suffering from anthracosis to be entitled to compensation. They had not much complaint against the policy adopted with respect to the medical examination of persons suffering from silicosis. There were three medical boards responsible for silicosis cases. The Home Secretary had been asked to consider extending the principle of medical boards to all cases of accidents. The medical referee had too much power; in fact, he was judge, jury, House of Lords and court of appeal in one. Was it not possible to extend the principle that applied to silicosis to all other accidents, so that the individual would have the satisfaction of being examined by a medical board It would mean the removal of a great deal of delay.

Then there was the question of prevention. The Home Office and the Mines department had been doing a great deal of good work in investigation and research into the prevention of accidents, but there was no coöperation or coördination between the two departments. The Mines department had been making investigations and research into the prevention of silicosis and a good deal of inquiry was made into the foam that had been invented to absorb the dust and into dust traps. An exhibition had been held at the Home Office the other day dealing with the prevention of accidents, but once an exhibition was held and inquiries and research had been conducted, nothing further was done. He would like to see more coöperation between the departments, and that when a particular means of prevention was approved, employers should be compelled to adopt it.

Captain Euan Wallace, Under Secretary, Home Office, replying to the debate, said, with regard to air raids, that responsibility of the central Government towards the civil population could not be ignored. This circular was only a preliminary, and would be followed up by conferences, and by the issue from the Air Raids Precautions Department of a series of technical handbooks. The congregation of people into places like the Mersey Tunnel, or the tube system of London, obviously held elements of the very greatest danger. It might be impossible to-day to secure complete immunity from aerial attack, but mitigation of its effects was well within the bounds of possibility, and there was no reason for the citizens of this or any other community to sit down with folded arms and wait for an assault.

Reference had been made to what was regarded as the deficiency in the staff of the factory inspectorate, but the 254 inspectors which they had at the moment were 14 more than they had last year and 7 above the maximum number they had ever had. On the advice of the expert Departmental Committee there was not at present sufficient evidence to justify putting Dupuytren's contraction on the schedule of industrial diseases. In order to be put on the scheduled list, it must be a disease which was definitely shown to be due to occupation and to nothing else. They could not, for instance, put asthma or hay-fever on the schedule, because they arose from some other causes than that of employment, but the Home Office would keep this question, and all other medical questions of the kind, very closely under review. With regard to the questions about medical referees and delay in decisions, the announcement that they proposed to set up a departmental committee to examine that and several other cognate questions would give general satisfaction.

The increase of accidents, regrettable as it was, must definitely be ascribed to (1) the general expansion of trade; (2) the fact, that men were coming back into work after long periods of unemployment; and (3) the fact that a general industrial reorganisation was now proceeding in this country as a result of a very large number of new processes. The fact that a high proportion of the accidents occurred among juveniles appeared to him to indicate rather failure of the human factor than inadequacy of the material precaution.

The motion to reduce the vote was negatived by 121 votes to 40 and the debate was adjourned.

Criminal Lunatics (Scotland) Bill

In the House of Commons on July 19th, when this Bill was being considered on report, Mr. JAMIESON, Lord Advocate, moved an amendment to clause 4, the effect of which he said, taken along with the amendments inserted in Committee, would be that where a person serving a sentence was found to be insane, but his insanity was such that he was not suitable to be sent to an ordinary asylum, he would be sent to a criminal lunatic asylum and the opportunity would be given to have him examined by his own medical man. The doctor's report would be considered by the Secretary of State, who would review the whole circumstances and make such order as might be necessary on the expiring of the sentence; if the person was not yet fit to be set at liberty on account of his insanity, and not fit to be sent to an ordinary lunatic asylum, certification to that effect would be given by two medical practitioners, one of whom was not to be in the prison service. An opportunity would be given at that time for the person to be examined by his own doctor. Again the Secretary of State, on receiving the reports, would consider the whole of the circumstances before making an order. The Lord Advocate added, that he understood that with these amendments the Bill was noncontentious. The amendment was agreed to and the Bill was read the third time and passed.

Precautions Against Air Raids

In the House of Lords on July 23rd, Lord MORLEY raised the question of the Home Office circular recently issued with regard to precautions against air raids. He said that the gas masks which would be available were of psychological value only. The Government would have to take the question of gas masks much more seriously. They must consider adults, children, and animals. Every mask was quite useless against chlorine gases.

The Earl of FEVERSHAM (Lord-in-Waiting) said that the Government most strongly deprecated the statement that there was no defence against gas attack, and that therefore it was useless to do anything at all. He had been informed by expert advisers that it was perfectly feasible to provide protection against gas. In fact it was often easier to provide this protection than protection against high explosive bombs. The steps which the Government contemplated would go a great way to minimise the dangers of this form of attack. Stories of gas possessing qualities against which no respirators were a protection were without foundation. The Government were actively engaged in designing a form of respirator which would supply adequate protection against gas for members of the general public. It was an essential requirement that the respirator should be available at a low cost. Such a respirator would provide adequate protection, in addition to such measures as people had been able to take to make some part of their houses gas-proof. In the recruitment of the humanitarian services, rescue work, first-aid treatment of casualties, and decontamination, the Government would be dependent to a large extent on the British Red Cross Society, the Order of St. John, and the St. Andrew's Ambulance Society, who had been good enough to say that so far as practicable they would place themselves at the disposal of both the central and the local authorities to supplement official resources. Respirators and protective clothing would be supplied to persons engaged in air raid services.

HOUSE OF COMMONS

WEDNESDAY, JULY 17TH

Hospitals and Electric Lighting Failures

Mr. BERNAYS asked the Minister of Transport whether, following on the recent failure of the system of electric supply in London, he would consider legislation making it compulsory for hospitals, theatres, and other public buildings to install an emergency automatic system.—Mr. HORE-BELISHA replied: I understand that the licensing authority ordinarily make it a condition of the licence that in places of public entertainment there shall be a system of dual lighting. I would not feel justified at this moment in interfering with the discretion of hospitals, who being aware of their own needs would naturally provide for them to the full extent of their economic resources.

Beddington Sewage Works

Mr. DORAN asked the Minister of Health if he was aware that similar insanitary conditions as experienced in 1934, emanating from the Beddington sewage works, were now recurring in the Mitcham, Beddington, and West Croydon areas, and during the recent hot weather it was impossible for the residents to frequent the commons in these respective districts owing to the prevalence of very offensive odours; and if, in view of the failure of the interim measures taken by the Croydon corporation, he would use every means in his power to put an end to this nuisance.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: My right hon. friend has arranged for an inspector to visit these works to-day in order to examine the conditions.

Rules under Pharmacy and Poisons Act, 1933

Sir ERNEST GRAHAM-LITTLE asked the Home Secretary whether, in view of the hardship caused by the exclusion of university graduates in chemistry, unless they were or became members or associates of the Institute of Chemistry, from the list of persons authorised to undertake or supervise the manufacture of pharmaceutical preparations containing any poison used in the internal treatment of human ailments, he would instruct his department to add to the categories of persons so authorised (Report of the Poisons Board, Cmd. 4192, Appendix II., Rule 27) persons qualified by the possession of degrees testifying competency in chemistry, issued by accredited universities, without being required to seek membership of the Institute of Chemistry.—Sir JOHN SIMON replied: Notice of my intention to make rules under the Pharmacy and Poisons Act, 1933, including the rule to which the hon. Member refers, has been published in accordance with the Rules Publication Act, 1893, and I shall not be in a position to take any final decisions until after the expiration of the period during which the draft rules are open for representations to be made to me. The hon. Member may rest assured that all such representations will be most carefully considered.

THURSDAY, JULY 18TH

Free Milk and Meals for School-children

Captain SPENCER asked the President of the Board of Education what, if any, representations had been made to him as to the effect of Circular 1437, dealing with the discontinuance of free milk and meals to school-children in certain cases.—Mr. OLIVER STANLEY replied: Certain representations have been made to the Board in the matter. The Board have made it clear that, before free meals or milk are withdrawn, a sufficient period should be allowed to elapse for the child's health to become firmly established. The Board have also stated that they would regard it as reasonable to take into account the conditions under which the child is living, and to take special precautions where those conditions are such that deterioration is probable if the meals are discontinued.

Captain SPENCER: May we take it that the statement in a Manchester newspaper that children must be half starved before they receive such assistance is totally untrue?—Mr. STANLEY: My hon. friend will see from the answer that that statement is completely without foundation.

Mr. MORGAN JONES asked the President of the Board of Education whether his attention had been called to the instruction given by the Conference of the Association of Education Committees to its executive to go into the legal aspect of Circular 1437 in relation to the selection of children for free milk and meals; and whether, in view of the opposition of local education authorities to the circular and the resolution adopted by the Council of the British Medical Association that the onus should not be placed upon a medical officer of determining in every case that a scholar was presenting evidence of subnormal nutrition before free milk or meals are provided, he proposed to withdraw it.—Mr. OLIVER STANLEY replied: I am aware of the instruction in question; I am not, however, prepared to withdraw Circular 1437. I am satisfied that the system recommended by the Board provides the most effective means of securing that meals or milk are supplied to children who need them in order that they may obtain full advantage from their education, and that under any other system many such children may be overlooked. While the system recommended by the Board is opposed by some local education authorities, there are many authorities who select children on the basis outlined in the circular.

Dr. ADDISON: Has the right hon. gentleman availed himself of the advice given by a number of experts a year ago as to the necessity of these children receiving milk?

No reply was given.

Aged Recipients and Public Assistance

Sir JOHN POWER asked the Minister of Health if he could furnish an estimate of the extent to which the increase in the population of persons in receipt of public assistance in the last 25 years arose from the greater longevity of the population.—Sir KINGSLEY WOOD replied: The number of persons who are over 65 years of age and are in receipt of relief is considerably smaller now than it was in 1906, owing to the introduction of old age pensions. The greater longevity of the population has, no doubt, had the effect of preventing a larger reduction, but I regret that I have no means of estimating that effect statistically.

MONDAY, JULY 22ND

Retained Foreign Body and a Pension

Mr. WHITESIDE asked the Minister of Pensions whether he was aware that Mr. Henry Fisher, of 9, Brompton-row, Dewsbury-road, Leeds, was originally granted a pension of 24s. a week, but that this was reduced to 8s. a week in 1922; that he was totally unable to work, and that, in the view of the highest medical authority at Leeds Infirmary, his disability was due to a piece of shrapnel lodged in his chest; and would he consider, therefore, increasing Mr. Fisher's pension.—Mr. R. S. HUDSON replied: In view of the strong opinion expressed by the surgeon at Leeds Infirmary, the whole case, including opinions in favour of the claim, was submitted to an eminent independent specialist nominated by the President of the Royal College of Physicians, who confirmed the view of my department that on the available evidence it could not be said that Mr. Fisher's condition was due to the presence of a retained foreign body. In the circumstances I much regret that I cannot see my way to adopt the course suggested.

Future of Wyton Sanatorium

Mr. THORNE asked the Minister of Health if he had yet replied to the Huntingdonshire county council's request for permission to sell Wyton sanatorium for consumptive children and adjacent lands, comprising nearly 200 acres to the Air Ministry; and where it was proposed that the children in question were to be sent and the price paid for the lands and buildings by the Air Ministry.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: My right hon. friend understands that the county council are considering whether, in view of the reduced demand for beds for children, this sanatorium is still needed for its present purpose, but they have not yet submitted any proposals to him.

Salaries of Medical Officers of Scottish Board of Control

Mr. GUY asked the Secretary of State for Scotland whether the salaries of the medical officers employed in the General Board of Control for Scotland were fixed irrespective of sex.—Sir G. COLLINS replied: The answer is in the affirmative, with the qualification that the present woman deputy commissioner retains a personal salary until her appointment as commissioner takes effect in October next.

VICTORIA HOSPITAL, SWINDON.—It is hoped to launch a private ward league here to extend the operation of the contributory scheme to higher paid workers.

ALL-INDIA OPHTHALMOLOGICAL SOCIETY.—At its fourth conference, held at Madras in April, this society submitted a series of resolutions to the notice of the authorities concerned in British India and the Indian States. These asked that steps should be taken to ensure that practitioners, midwives and others concerned in the conduct of childbirth should possess a practical knowledge of the prophylaxis of ophthalmia-neonatorum; that medical officers employed on nutritional research should report on conjunctival xerosis or keratomalacia as seen in hospitals, and make practical suggestions as to how the food defects responsible may be met; that the Government of India should institute an enquiry into the disturbing information given by the International Association for the Prevention of Blindness about the high incidence of trachoma in Indian regiments; that legislation regarding the inspection of the eyes of school-children be introduced at a very early date throughout British India and the States; that the machinery for the prevention of smallpox should be tightened up; that propaganda should be undertaken for the instruction of the uneducated concerning the prevention of blindness; and that medical departments for the treatment of the venereal diseases should be instituted, strengthened or extended, such being modelled, so far as possible, on those in existence in Great Britain.

OBITUARY

HELEN CHAMBERS, C.B.E., M.D. Lond.

Dr. Helen Chambers, whose enterprise and energy led to the foundation of the Marie Curie Hospital, died in Devonshire on July 21st after a long illness. Born in India, the only daughter of Frederick Chambers, I.C.S., Helen Chambers was educated privately in Guernsey and London and at Newnham. She entered the London (R.F.H.) School of Medicine for Women in 1898, and after a distinguished career as a student qualified in 1903 with a gold medal in forensic medicine and first class honours in obstetrics. She took the B.S., in 1904, and was at once made assistant pathologist and clinical pathologist to the Royal Free Hospital; Dr. A. G. Phear, one of the assistant physicians, being at that time pathologist to the hospital. Dr. Chambers's post was not a full time one and during the next few years she also held various research scholarships, notably the Mabel Webb research scholarship, and a newly founded scholarship in the cancer research department of the Middlesex Hospital, being one of the first of these scholars. Dr. Chambers took the M.D. in pathology in 1908, and in 1914 resigned from her post at the Royal Free Hospital to join the staff of the Military Hospital in Endell-street, which was staffed entirely by medical women, as pathologist. She worked there throughout the war and in 1920 received the C.B.E. in the first batch of those decorated with the Order of the British Empire. After the war Dr. Chambers became a full-time worker for the Medical Research Council at the Middlesex Hospital and the Marie Curie Hospital.

Her first publications were concerned with the thyroid gland, but as early as 1911 she began, in collaboration with Prof. S. Russ, the series of papers on different aspects of the biological effects of radium, for which she is chiefly known. Dr. Chambers became enthusiastic about the possibilities of radium therapy, especially for cancer of the cervix, and at a meeting of the London Association of the Medical Women's Federation in the spring of 1924 she induced the Association to appoint a committee to organise and carry out clinical research on this subject. A scheme was submitted to the Medical Research Council, and, with the coöperation of the British Empire Cancer Campaign, enough radium was received on loan to make a start and enough money to appoint a medical research officer as coördinating director. For three years the work was carried out at the three hospitals staffed by medical women in London and at the New Sussex Hospital for Women at Brighton, but the inconvenience of this plan became manifest, and in 1928 the radium research was concentrated at the Marie Curie Hospital at Fitzjohn-avenue with outstanding success.

Dr. Chambers never allowed her name to be personally associated with this or any other achievement—the only thing she cared about was that a "bit of work," to use her own phrase, should be done. Her anxiety was to persuade clinicians working with radium at the hospital to adopt the technique decided on, after extensive inquiry at home and abroad, without variation, so that the value of the method could be determined. This unification of treatment was made possible by the appointment of a medical research officer of experience and the success of the Marie Curie hospital in accumulating valuable records is due largely to the loyalty of the team to the ideals of the original research committee. Dr. Chambers had a rare combination of mental qualities, vision, zeal for controlled scientific research, and desire for social service. The outstanding features of her character were truth and loyalty. She was modest and retiring in disposition, but was always ready to come out of her shell of reserve to help those in physical or mental trouble. Her hobby was gardening, at which she was expert. She lived out of London, but attended regularly discussions at meetings of medical societies when subjects in which she was interested were under discussion; the loss of her critical judgment will be felt by all those concerned with the clinical applications of radium and X rays.

CHARLES GRAHAM GRANT, L.R.C.P., L.R.C.S. Edin., V.D.

THE death occurred on July 17th, of Dr. Graham Grant, doctor and barrister, who occupied until the beginning of the year the position of first clerk of arraigns at the Central Criminal Court, London.

Photograph by Lafayette

DR. GRANT

Charles Graham Grant was the son of Mr. Dundas-Grant, an Edinburgh advocate. He was born in 1864, received his professional education in the medical school of the University of Edinburgh, and qualified as L.R.C.S., L.R.C.P. Edin. in 1885. His varied medical work was all done in London, where he held at different times the posts of surgeon to the Poplar Hospital and medical officer to the Rotherhithe Tunnel works. He was also on the staff of the Tower Hamlets Dispensary and was medical officer to the Eastern District of the Post Office. He was surgeon to the H Division of the Metropolitan Police and for a period worked as clinical assistant at the Central London Throat and Ear Hospital. At different times also he served as surgeon on the following steamships: *City of Manchester*, *City of Oxford*, and *Anchises*. For a time he held a commission in the 24th Middlesex R.V., obtained the volunteer decoration, and at the time of the war was lieutenant-colonel, R.A.M.C. (T.F.). Much interested in medico-legal questions arising out of his work as police surgeon he wrote a manual on forensic medicine, and a small book, the "Diary of a Police Surgeon," which recorded his experiences in that capacity in an amusing and picturesque manner. In 1910, when he had been in practice for 25 years as a doctor, he was called to the Bar by Gray's Inn and was appointed Clerk of Arraigns in the Central Criminal Court, a position which he held for the next 25 years.

That is the bare outline of a life of great interest. Endowed with physical vigour, courage and strength of mind, Grant was able to perform the duties in his manifold fields of work with conscientiousness, undeterred by opposition or undue fear of offending.

Without aiming at high academical distinctions he maintained a solid standard of technical efficiency, directed by sound judgment and unruffled presence of mind. These qualities stood him in good stead as surgeon to the two large police areas where he was called at all hours to deal with cases of varying gravity. This long and observant experience inspired his book, entitled in its first edition "The Police Surgeon's Emergency Guide," a vade mecum that has been of service to many of his colleagues. His capacity for dealing with large bodies of men was displayed in his activities as surgeon to huge Post Office districts and medical officer to the Post Office Rifles in time of peace, as also to several large military camps during the war. When recommended for appointment to the post of Clerk of the Arraigns at the Old Bailey, the high official in whose hands the appointment lay stated that "he wanted as a coadjutor a man who when he said he had done a thing had certainly done it." In Grant he found his man. His devotion to the late Common Sergeant, Sir Henry Dickens, was most touching. It is no secret that during the later years of Sir Henry's life his work as judge was rendered difficult by an increasing dulness of hearing and that it would have been scarcely possible for him to have continued dispensing justice, for which he was so adapted (and did so acceptably) had it not been for the imperturbable support given by the younger man in interpreting evidence and statements which were often difficult to hear. For Graham Grant this work for his aged friend and principal superior was truly a labour of love.

Graham Grant had a highly attractive personality In his strenuous life he derived great enjoyment from the possession of many friends, and if they contributed to his happiness he in turn enhanced theirs. His high spirits made him a much-desired companion, and he will be greatly missed by many far beyond his family circle as well as by those to whom he was near and dear. His witticisms, his friendly repartees, his stories, Scotch as well as others, his songs, quaint and tuneful, his good-natured banter and his readiness to laugh over his own mishaps rather than over those of others, his ability and equanimity in games of skill will be recognised as among his social characteristics by those who had the pleasure of knowing him. He was a beloved and respected member of the Savage Club, who in large numbers testified to their respect for his memory by attending the funeral ceremony at Golders Green.

Dr. Graham Grant married Miss Jane Campbell Greig, of Perth, and leaves an only daughter, with three grandchildren, and though much sought after for social functions he had always strong domestic feelings. He occupied much of his spare time in household carpentering, at which he was an adept, and greatly enjoyed playing the piano for his young grandchildren to dance to.

JESSIE HANDYSIDE GELLATLY, M.D.

D.P.H. Edin.

THE death has occurred of Dr. Jessie Gellatly widely known for her official work in the county of Cambridge. She was born in 1884, the daughter of Mr. Stewart Gellatly, educated at the Medical College for Women, Edinburgh, and graduated M.B., Ch.B., at the university in 1906. She proceeded to the M.D. degree in 1910, and in the same year obtained the D.P.H. She was for a time house physician at the Leith Hospital, and filled the same post at the Hull Children's Hospital, after which she became resident medical officer at the Walthamstow Sanatorium, and later assistant medical officer to Messrs. Cadbury Bros. During the war she worked with the R.A.M.C. at Malta, Salonika, and in Serbia. At the conclusion of hostilities she was appointed assistant medical officer to the county of Cambridge, a post which she held for nearly 20 years and was holding at the time of her death. Here she proved an indefatigable worker. Her days were occupied with the inspection of schools, 130 in all, but she also gave in the evenings courses of lectures on school hygiene at the Homerton Teachers' Training College, Cambridge. An example of the way in which Dr. Gellatly interpreted her duties will be found in an article which she wrote in these columns (THE LANCET, Feb. 11th, 1933, p. 342) on milk consumption in rural households. Her experience of school medical inspection in her East Anglian area had shown her that the majority of children did not get milk as a beverage, tea of varying strength being commonly drunk from weaning, often a protracted period. In order to obtain evidence of the milk actually used in a number of households, Dr. Gellatly questioned 150 mothers attending school medical inspections, and set out in detail, with appropriate tables, figures showing that in the majority of the families the supply of milk was inadequate, while there was no compensating supply of other animal fats of good quality. The evidence supplied by Dr. Gellatly's investigation agreed with the recommendations to be found in the report of the Milk Commission; it was an excellent piece of work.

Miss M. M. Allan, principal of the Homerton Teachers' Training College, writes: "Dr. Gellatly's experience made her contribution to the training of young teachers extraordinarily valuable, for her daily contact with the problem of the maintenance of the health of school-children lent reality to her precepts. It was in this daily work in the schools that she made her most valuable contribution and formed some of her most lasting friendships. The school teachers in remote country districts found in her not only a wise consellor but a friend interested in their personal lives, and in their homes as well as their schools she received a warm welcome. Her work was difficult and of necessity lonely, demanding hard driving to remote districts in all weathers, but it was always her absorbing life interest and she carried it out with great independence of thought and wonderful courage. Her friends to whom her early death will prove an irreparable loss, are hoping to endow a child's cot at the local hospital in her memory."

MEDICAL OFFICERS IN INDUSTRY OVERSEAS.—A meeting was held at the Ross Institute of Tropical Hygiene, London School of Hygiene and Tropical Medicine, on July 9th, to discuss the advisability of holding an annual conference to enable medical officers in industry overseas when on leave to meet together and review their various problems. Prof. W. W. Jameson, dean of the school, was in the chair. Medical officers present decided unanimously to accept the hospitality of the Ross Institute as their headquarters when on leave and to meet there for the discussion of professional matters. It was agreed that at first a conference lasting one day should be held in the beginning of July each year, invitations being issued through the medium of the British Medical Association and the various industrial associations. Any Government health officers home on leave from overseas would be invited to attend, and free discussion encouraged on any subject put forward by the medical officers present.

MEDICAL NEWS

University of Oxford

On July 20th the following degrees were conferred :—

D.M.—J. F. Brock, J. H. Hunt, C. W. Flemming, and C. R. Lane.

B.M.—J. R. Hollick, C. Hollins, N. Leitch, A. P. Meiklejohn, W. E. Henley, D. H. Hertz, W. R. Trotter, J. W. A. Turner, R. Bevan, E. M. Buzzard, C. F. Hamilton-Turner, P. C. Alexander, P. G. Burgess, H. Burton, W. J. C. Anstie, M. C. Chapman, J. C. Penton, D. F. G. Moir, and K. B. Dawson.

University of Cambridge

At recent examinations the following candidates were successful :

D.M.R.E.

Part I.—D. P. Bali, Alfred Pollitt, and I. G. Williams.

Part II.—D. P. Bali, J. L. Dobbie, T. P. Eustace, Leonard Freeman, A. H. Gibson, David Glass, P. R. Goodfellow, T. A. Green, B. T. Hooper, W. G. S. Hopkirk, A. S. Johnstone, Z. J. Joseph, A. H. Jowell, D. R. McPherson, Sambhunath Mukerjee, H. S. Rassim, and Beatrice M. Willmott.

University of Edinburgh

On July 17th the hon. degree of doctor of laws was conferred on Alfred Newton Richards, professor of pharmacology in the University of Pennsylvania. The following degrees and diplomas were also conferred :—

M.D.—A. A. F. Brown, J. A. Burgess, J. A. *Douglas, G. A. H. Gumley, T. B. Harvey, R. L. Langley, R. P. A. Macaulay, D. T. M'Donald, A. A. Miller, and A. A. Robertson.

* Commended for thesis.

Ph.D.—Heinz Schild and Hem Kanti Sinha (in absentia).

M.B., Ch.B.—H. M. Adam, J. D. Allan, John Allison, G. F. Anderson, K. C. Balfour, P. M. Barclay, Betty B. Barnetson, A. F. M. †Barron, Monoranjan Bhattacharjee, D. B. Black, J. B. Borthwick, Isaac Bortz, W. R. Brewer, A. K. Brooke, Stewart Brown, T. H. †Brown, R. T. Campbell, J. E. S. Carmichael, W. I. Chalmers, W. A. Coe, C. H. Comrie, W. R. M'K. Couper, J. M. Crawford, W. T. Cumming, H. A. Deverell, H. L. de Waal, J. M. Dick, Charles Donald, John Duncan, Jacobus du Toit-le Roux, Hermione K. S. Egerton, J. N. I. Emblin, M. R. †Ewing, Sigmund Falk, J. A. Farfor, Jean A. Forbes, J. W. Forbes, I. T. †Fraser, Henry Friedman, A. G. Gathorne-Hardy, Mary D. Gibson, James Gillan, I. C. Gilliland, J. C. R. †Greig, R. S. Hardie, J. P. Harger, M. S. Harvey, N. S. Hepburn, Thomas Hepburn, D. S. Hiddleston, Matthew Hunter, R. M. M. Hunter, J. J. M. Jacobs, John Jamieson, W. H. Kinstrie, T. A. Knowling, J. C. Lees, William Limont, M. G. Low, D. A. †Lowe, Abraham Lutton, Sydney Lyons, Allan M'Diarmid, V. P. M'Donagh, [illegible] Macdonald, A. M. M'Farlan, T. C. [illegible] A. M. Mackenzie, John MacKenzi [illegible] Macqueen, M. S. H. Makarim, O. A. S. Marais, E. G. L. Mark, W. H. C. Masters, J. S. Maxwell, F. O. Mell, Margaret MacK. Methven, G. R. Millar, Benjamin Miller, R. A. Miller, Robert [illegible] Niazi, J. C. Nicholason, A. A. Orr, [illegible] T. Paterson, H. O. [illegible] A. I. Pirie, J. E. Place, H. J. Pratap, [illegible] †Riley, A. J. A. Robertson, K. V. A. [illegible] gan, Leah Rosenbloom, J. B. Ross, C. [illegible] yness, John Scott, William Serle, William Simpson, Joan J. V. Spurway, Harry Stalker, C. P. Stevens, David Stevenson, N. F. Stocks, E. W. Stout, A. W. B. Strahan, Marian E. Sturrock, E. C. S. Talbot, A. N. Taylor, Alta F. Thompson, J. W. Thompson, C. H. Thomson, E. L. Thomson, G. M. Thomson, John Tillman, C. H. Tomlinson, G. F. Valentine, Wilhelmina J. Wagenmaker, R. M. Warren, J. D. Watt, A. [illegible] lkinson, N. V. Williams, C. M. Wilson, J [illegible] W. M'I. †Wilson, K. M. Wood, David [illegible]

† With honours.

D.P.H.—J. F. Caithness, G. W. Gale (in absentia), D. R. Huggins, D. J. Morrison, H. P. Tait, C. A. Green, Elspeth M. Warwick, and Henry Waters.

D.T.M. & H.—Charles Bowesman, A. B. Guild, and Alexander Scott.

Diploma in Psychiatry.—I. S. Campbell (in absentia), M. A. Nasr, and C. M. Ross.

Diploma in Radiology.—J. A. C. Fleming, J. P. M'Gibbon, A. G. G. Melville, and R. E. Verney.

The following awards of prizes were made :—

Cameron prize [illegible] ics to Julius Wagner-Jauregg, M.D., [illegible] psychiatry and neuropathology in th[illegible] in recognition of his discoveries regarding the malarial treatment of general paralysis ; Ettles scholarship and Leslie gold medal to M. R. Ewing M.B. ; Scottish Association for Medical Education of Women prize, to Frances M. H. Wilkinson, M.B. ; Murchison memorial scholarship in clinical medicine, W. M'I. Wilson, M.B. ; Mouat scholarship in the practice of physic, M. R. Ewing, M.B. ; Buchanan scholarship in midwifery and gynæcology, I. T. Fraser, M.B. ; James Scott scholarship in midwifery and gynæcology, T. H. Brown, M.B. ; Beaney prize in anatomy and surgery, T. H. Brown, M.B., and I. T. Fraser, M.B. ; Conan Doyle prize, J. N. I. Emblin, M.B. ; Annandale gold medal in clinical surgery, William Simpson, M.B. ; Royal Victoria Hospital tuberculosis trust gold medal, D. A. Lowe, M.B. ; Murdoch Brown silver medal in clinical medicine, A. F. M. Barron, M.B. ; Dorothy Gilfillan memorial prize, Margaret M'K. Methven, M.B. ; Wightman prize in clinical medicine, T. H. Brown, M.B. ; Pattison prize in clinical surgery, Alta F. [illegible] bert Jones prize in orthopædic surgery, [illegible] ; Syme surgical fellowship, J. J. M. [illegible] Barbour fellowship, N. G. Steere, [illegible] F. J. C. Herrald, M.B. ; Gunning [illegible] public health, C. A. Green, M.B. ; Gunning Victoria jubilee prize in medicine, I. M'Kenzie, M.B., and C. E. Van Rooyen, M.D.

An address was delivered to the new graduates by Prof. R. W. Johnstone, the promotor. See p. 215.

University of London

Mr. H. R. B. Fenn, lecturer in dental mechanics and prosthetics in the University of Liverpool, has been appointed as first holder of the chair of dental prosthetics at Guy's Hospital medical school ; Mr. James Whillis, F.R.C.S., lecturer in anatomy at the College of Medicine, Newcastle-on-Tyne, to the university readership in anatomy at the same school ; and Mr. E. P. Stibbe, senior demonstrator of anatomy at the London Hospital Medical College, to the university readership in anatomy at King's College.

Society of Apothecaries of London

At recent examinations the following candidates were successful :—

Surgery.—G. B. Barbour, Univ. of Camb. and Guy's Hosp.; A. H. El S. El Mahallawy, Roy. Coll., Edin. ; A. Morgan, Univ. of Manch. ; A. Ponder, Univ. of Camb. and Guy's Hosp. ; and K. G. Wrigley, Univ. of Sheff.

Medicine.—G. B. Barbour, Univ. of Camb. and Guy's Hosp.; H. N. Davis, Univ. of Oxf. and St. Bart.'s Hosp. ; E. M. Frankel, [illegible] E. T. Garthwaite, St. Bart.'s Hosp.; [illegible] of Oxf. and Guy's Hosp. ; J. B. Mair, [illegible] P. Pauli, Univ. of Brist. ; and G. N. [illegible] d West London Hosp.

[illegible]—G. B. Barbour, Univ. of Camb. and Guy's Hosp. ; H. N. Davis, Univ. of Oxf. and St. Bart.'s Hosp. ; E. M. Frankel, Westminster Hosp. ; J. B. Mair, Univ. of Glasg. ; and G. N. Rodgers, Bombay and West London Hosp.

Midwifery.—A. Aspinall, Univ. of Manch. ; A. N. Coondoo, Univ. of Durham ; G. R. Hopper, Univ. of Liverp. ; and F. W. Treadwell, Univ. of Birm.

The following candidates, having completed the final examination, are granted the diploma of the society, entitling them to practise medicine, surgery and midwifery :—

A. Aspinall, E. T. Garthwaite, A. H. El S. El Mahallawy, J. B. Mair, K. P. Pauli, A. Ponder, F. W. Treadwell, and K. G. Wrigley.

Royal College of Physicians of London

The College will be closed from Thursday, August 1st to Saturday, Sept. 14th.

Royal College of Physicians of Edinburgh

A quarterly meeting of the College was held on July 16th, with Dr. Edwin Bramwell, the president, in the chair. Dr. Sorab Kaikhoshru Engineer (Bombay) and Dr. Alexander Hay Rintoul (Crieff) were introduced and took their seats as fellows. Dr. Joseph Bryant (Khartoum), Dr. Hanna Barsoum (Alexandria, Egypt), Dr. Ratan Kumar Misra (Delhi, India) and Dr. Pritan Varialsing Karamchandani (Waziristan, India) were elected to the fellowship.

Royal College of Surgeons of Edinburgh

At a recent meeting of the College, with Dr. A. H. H. Sinclair, the president, in the chair, the following, who passed the requisite examinations, were admitted to fellowship :—

Sushil Kumar Nag Chowdhury, M.B. Calcutta ; Eyjolfur Jonsson, M.D. Manitoba ; Patrick Clarence Anderson, M.B. N.Z. ; Bernard Albert Armitage, L.R.C.P. Edin. ; Hamilton Bell, M.B. Belf. ; Andrew Anderson Bonar, M.B. Glasg. ; Hugh Benjamin Boucher, M.R.C.S. Eng. ; John Austen Percival Cameron, M.B. Edin. ; Eric Alan Davison, M.D. Belf. ; Wallace Milne Dennison, M.B. Glasg. ; Krishna Chintaman Gharpure, M.B. Bombay ; James Porter Heron, M.B. Edin. ; Benjamin Holden, M.Chir. Camb. ; John Muil Melvin, M.D. Glasg. ; James Stuart McGregor, M.D. Ontario ; Daniel John Percy Parker, M.B. Belf. ; Edgar Rowan Rankin, M.B. Witwatersrand ; and David Swartz, M.D. Manitoba.

Edinburgh Royal Infirmary

Lieut.-Colonel A. D. Stewart, C.I.E., I.M.S., has been appointed medical superintendent of the Royal Infirmary, Edinburgh, in succession to the late Colonel Thom. Colonel Stewart, who is 52 years of age and an Edinburgh graduate, is at present director of the All-India Institute of Hygiene and Public Health in Calcutta. He is likely to take up his new duties in the autumn.

A Deputation on Maternal Mortality

Last Tuesday Sir Kingsley Wood, the Minister of Health, received a deputation from the Standing Joint Committee of Industrial Women's Organisations. Dr. Esther Rickards said that no local authority was at present using to the full its powers to provide maternity services; and urged that the Ministry should compel them to provide satisfactory services. She referred to the standard of work of medical practitioners employed by local authorities, and suggested that the terms of service should be made more attractive and that only doctors with special obstetrical experience be employed. She also advocated the provision of a municipal service of midwifery. Alderman Rose Davies gave an account of the good results following the work of the Birthday Trust in the Rhondda, and asked for special financial assistance for distressed areas. Mrs. E. Barton stressed the importance of a proper provision of home-helps. She also took the view that a maternity patient should not be moved for at least 24 hours after her confinement, and that where a confinement took place in hospital she should not be sent home for fifteen days. Miss Mary Sutherland spoke of the need for postnatal clinics and for an inquiry into maternal morbidity, with particular reference to nutrition, and asked that local authorities should be urged to use more extensively their power to supply milk and meals. She also advocated legislation to secure the elimination of the untrained handywoman. Mrs. Ayrton Gould said that pregnancy commonly meant the loss of employment, and a woman who lost employment in this way was often unable to obtain either unemployment insurance benefit, or health insurance benefit. She hoped the Government would ratify the Washington Maternity Convention which would prevent the employment of women six weeks before and after confinement.

In his reply, Sir Kingsley Wood said that, comparing 1931 with 1934, there had been a steady increase in the provision of maternity services by local authorities; the number of antenatal clinics had increased by nearly 20 per cent., the number of women attending them by 23 per cent.—attendances reached nearly a million last year—the number of maternity beds by over 10 per cent., and the number of women admitted to them by 30 per cent. In addition the quality of maternity accommodation controlled by local authorities had been improved and most municipal hospitals aimed at retaining a patient for fourteen days after delivery. The majority of maternity and child welfare authorities now provided obstetric consultants, some 400 local authorities provided food or milk free or at cost price, and 133 provided home-helps. Action to stimulate the authorities of the areas where development was needed would be continued, but persuasion would as a rule do more than compulsion. The Ministry had been constantly pressing the need of improving and effecting services wherever necessary, and there never had been any question of their curtailment on financial grounds, even at the height of the financial crisis. On the contrary, special reference had been made to the need of their development, a point which was again emphasised last year when it was decided to institute special investigations into areas with persistently high rates of maternal mortality. Through the coöperation of doctors and midwives with the officers of the Ministry of Health information about fully three-quarters of the maternal deaths each year was obtained and forwarded to the Ministry. When the results of the present intensive investigation into maternal mortality had been received, it would be possible to decide the next steps to be taken in connexion with maternal morbidity. While there was no foundation at present for any definite statement on the relationship of nutrition to maternal mortality or morbidity special attention was being paid to this aspect of the problem. Proposals for an organised service of salaried midwives were receiving careful attention.

London (R.F.H.) School of Medicine for Women

The A. M. Bird post-graduate scholarship in pathology has been awarded to Dr. Margaret A. Jennings, and the Mabel Webb and A. M. Bird research scholarship to Dr. F. Charlotte Naish.

Princess Elizabeth of York Hospital

This institution at Shadwell, formerly known as the East London Hospital for Children and now called the Princess Elizabeth of York Hospital for Children, is being rebuilt at Banstead. The grounds were opened on July 22nd for subscribers to visit the site for the new hospital. An out-patient department will be run in the East End in conjunction with a hospital and convalescent home in the country.

Appointments

BEGG, N. D., M.D. Aberd., D.P.H., has been appointed Medical Superintendent of Infectious Diseases Hospital, Southend-on-Sea.

CUTLER, ROBERT, M.R.C.S. Eng., L.D.S., Hon. Dental Surgeon to Cheyne Hospital for Children, Chelsea.

DODDS, R. L., M.Ch. Belf., F.R.C.S. Eng., M.C.O.G., Hon. Out-patient Surgeon to the Samaritan Free Hospital for Women, London.

HUDSON, T. G. F., M.B., M.R.C.P. Lond., Resident Medical Officer of the General Infirmary, Salisbury.

HOLMES, J. M., M.B. Leeds, M.R.C.P. Lond., Hon. Physician to the Staffordshire General Infirmary.

PINCKNEY, C. P., M.B. Camb., M.R.C.P. Lond., Temporary Assistant Physician to St. George's Hospital.

REES, T. P., M.D., M.R.C.P. Lond., D.P.M., Medical Officer at the Croydon Mental Hospital.

SCOTT, J. A., M.D. Liverp., D.P.H., Medical Officer of Health for Fulham.

SCOTT, T. F. MCNAIR, M.R.C.P. Lond., Assistant Physician to St. George's Hospital.

SUGGIT, S. C., M.B. Lond., F.R.C.S., Hon. Assistant, Ear, Nose, and Throat Surgeon to the Children's Hospital, Hampstead.

WOOD, G. N., M.B. Camb., Hon. Assistant Physician to the Royal East Sussex Hospital, Hastings.

Certifying Surgeons under the Factory and Workshop Acts: Dr. N. J. BEE (Wainfleet, Lincoln); Dr. R. L. Walker (Lowestoft, Suffolk); Dr. J. W. BROMLEY (Bury St. Edmunds, Suffolk); Dr. A. L. WILLIAMS (Melbourne, Leicester); Dr. J. MATHESON (Rickmansworth, Hertford); Dr. W. P. GRACIE (Furnace, Argyll).

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hospital.—H.S. £150.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.

Bedford County Hospital.—Second H.S. At rate of £150.

Benenden, Kent, National Sanatorium.—H.P. At rate of £75.

Birmingham and Midland Eye Hospital.—H.S. At rate of £130.

Bolton Royal Infirmary.—H.S. £125.

Bradford Royal Infirmary.—H.S. At rate of £135.

Cambridgeshire County Council.—Asst. County M.O. £500.

Canterbury, Kent and Canterbury Hospital.—2 H.S.'s. Each at rate of £125.

Cardiff, Prince of Wales' Orthopædic Hospital.—Jun. H.S. At rate of £100.

Carlisle, Cumberland Infirmary.—H.P. Also Second H.S. Each at rate of £155.

Chester Royal Infirmary.—H.P. and two H.S.'s. Each £150.

Chichester, Royal West Sussex Hospital.—Sen. H.S. £175.

Chorley & District Hospital, Lancs.—H.S. At rate of £150.

Colchester, Essex County Hospital.—H.P. £150.

Derbyshire County Council.—Locum Asst. Maternity and Child Welfare M.O. At rate of £600.

Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts. £175.

Eastbourne, Princess Alice Hospital.—Res. H.S. £150.

East Ham Memorial Hospital, Shrewsbury Road, E.—H.P. At rate of £150.

Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £120.

Gloucestershire Royal Infirmary &c.—H.S. At rate of £150.

Gravesend & North Kent Hospital.—Jun. H.S. At rate of £125.

Harrogate Royal Bath Hospital.—Res. M.O. £156.

Herefordshire C.C.—Asst. County M.O. and M.O.H. £750.

Hertford County Hospital.—H.P. At rate of £150.

Ilkley, Middleton-in-Wharfedale Sanatorium.—Sen. Asst. M.O. £450.

Institute of Medical Psychology, Malet Place, W.C.—Pædiatrecian.

Jersey General Hospital and Poor Law Infirmary.—Asst. Res M.O. At rate of £150.

Leicester Royal Infirmary.—Jun. Res. Anaesthetist. £125.

Liverpool City.—Res. Asst. M.O.'s for Special Hospitals. Each £200.

Liverpool Heart Hospital.—H.P. At rate of £100.

Liverpool, Mill-road Infirmary.—Sen Res. Asst. M.O. (Surgical). £350.

Liverpool University, Lectureship in Bacteriology.—£400

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Manchester Ancoats Hospital.—Two H.S.'s. Each at rate of £100.

Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

Manchester Northern Hospital, Cheetham Hill-road.—Hon. Pathologist. £100. Also Bio-Chemist for Pathological Dept. £120.

Manchester Royal Infirmary.—Res. Clin. Pathologist. £150.

Miller General Hospital, Greenwich-road, S.E.—Anæsthetist. 52 guineas.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. and H.S. Each at rate of £100.

Northampton County Mental Hospital, Berrywood.—Deputy Med. Supt. £550.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Nottingham Children's Hospital.—Res. H.S. At rate of £150.

Nottingham General Hospital.—H.S. For Ear, Nose and Throat Dept. At rate of £150.

Oswestry, Robert Jones and Agnes Hunt Orthopædic Hospital.—H.S. At rate of £200.

Preston, County Mental Hospital, Whittingham.—Deputy Med. Supt. £750.

Princess Beatrice Hospital, Earl's Court, S.W.—Hon. Clin. Asst.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—Cas. O. Also H.S. Each at rate of £125.

Queen Mary's Hospital for the East End, E.—Cas. and Out Patient Officer. At the rate of £150.

Queen's Hospital for Children, Hackney-road, E.—H.S. and Cas. O. Each at rate of £100. Also Sen. Res. M.O. At rate of £200.

Reading, Royal Berkshire Hospital.—Cas. O. At rate of £125.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Rotherham Hospital.—Cas. H.S. £150.

St. Albans, Middlesex Colony for Mental Defectives, Harper Lane, Shenley.—Second Asst. M.O. £460.

St. Leonards-on-Sea, Buchanan Hospital.—Hon. Anæsthetist.

Sheffield, Children's Hospital.—H.S. At rate of £100.

Sheffield, Royal Infirmary.—Ophth. H.S. At rate of £120.

Stoke-on-Trent, Longton Hospital.—H.S. £160.

Sunderland Royal Infirmary.—H.P. £120.

Sutton and Cheam Hospital, Surrey.—Two Hon. Physicians.

Tunbridge Wells, Kent and Sussex Hospital.—H.S. £150.

Walsall, Manor Hospital.—Jun. Res. Asst. M.O. £150.

West Africa, St. Joseph's Hospital, Bolahun, Liberia.—M.O. £250.

Worksop, Victoria Hospital.—Sen. H.S. At rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Llantrisant (Glamorgan), and Chester (Cheshire); latest date for receipt of applications July 30th; at Linlithgow, W. Lothian; applications before August 6th.

Births, Marriages, and Deaths

BIRTHS

BRUCE.—On July 16th, at Ranchi, India, the wife of Nigel Patrick Bruce, B.M. Oxon., of a daughter.

BUNYAN.—On July 18th, at Devonshire-place, the wife of John Bunyan, Surg. Lt. (D), R.N.V.R., Sheerness, of a son.

DREW.—On July 14th, the wife of Capt. W. R. M. Drew, R.A.M.C., of a son.

GALLAGHER.—On July 19th, the wife of C. E. Gallagher, M.R.C.S. Eng., Sidcup, Kent, of a daughter.

MCELDOWNEY.—On July 17th, at Carlton-road, S.W., the wife of A. P. McEldowney, M.R.C.S. Eng., of a daughter.

ORD.—On July 18th, at Knaresborough-place, S.W., the wife of G. E. Ord, M.B. Aberd., of a daughter.

PETERKIN.—On July 13th, at Hull, the wife of Dr. J. H. Stuart Peterkin, of a son.

SHEPPERD.—On July 16th, at Sutherland-avenue, W., the wife of Ronald Shepperd, L.D.S. R.C.S., of a daughter.

MARRIAGES

LEE—JACOBS.—On July 16th, at the Central Synagogue, Maurice Lee, F.R.C.S. Eng., of Wimpole-street, to Rosalie Doreen, elder daughter of Mr. Gaskell Jacobs, of Regent's Park.

MACDONALD—BOYLE.—On July 19th, at the Cathedral Church of St. Mary, Edinburgh, George Alexander Macdonald, M.B. Glasg., to Marguerite Louise Edwina, eldest daughter of Captain W. E. Boyle, A.E.C., Edinburgh.

PAYNE—WILLIAMS.—On July 20th, at St. Laurence Church, West Woodhay, Richard Vaughan Payne, M.B. Camb., to Zoë Mary Williams, only daughter of Mr. W. A. Williams, of West Woodhay.

ROBINSON—JACKAMAN.—On July 16th, at St. Giles' Church, Stoke Poges, Bucks, Allan Betham Robinson, M.B. Lond., to Evelyn Margaret, younger daughter of Mr. C. J. Jackaman, of Slough.

DEATHS

DE LISLE.—On July 14th, at Brunswick-square, Hove, Samuel Ernest de Lisle, L.R.C.P. Irel., many years Superintendent of Three Counties Asylum, aged 85.

FLETCHER-BARRETT.—On July 6th, suddenly, at Royat, France, William Fletcher-Barrett, M.B. Lond., of Cairo, Egypt.

GRANT.—On July 17th, Charles Graham Grant, L.R.C.P. Edin., V.D., Barrister-at-Law, Lieut.-Colonel R.A.M.C. (T.F.), late First Clerk of Arraigns, Central Criminal Court, aged 71.

HAYNES.—On July 16th, at Royal Naval Hospital, Chatham Surg.-Comdr. John Frederic Haynes, M.R.C.S. Eng., of Leamington Spa, aged 44.

MILLER.—On July 17th, at Clive-court, W., Arthur Alan Miller, M.D. Durh.

SHAW.—On July 18th, at a nursing home, Inverness, John Shaw, M.B. Aberd., of Grantown-on-Spey, formerly of Denmark-hill, S.E., aged 57 years.

TREDINNICK.—On July 20th, in London, Ernest Tredinnick, M.R.C.S. Eng., L.R.C.P. Edin., formerly of Craven Arms, Shropshire, aged 84.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary

SOCIETIES

INTERNATIONAL NEUROLOGICAL CONGRESS.

MONDAY, July 29th.—9.30 A.M. (University College, Gower-street, W.C.), opening. 10 A.M., Discussion: The Epilepsies—their Ætiology, Pathogenesis, and Treatment.

TUESDAY.—9.30 A.M., Discussion: The Physiology and Pathology of the Cerebro-spinal Fluid.

WEDNESDAY, July 31st.—9 P.M. (B.M.A. House, Tavistock-square, W.C.), Prof. O. Foerster: The Motor Cortex in Man in the Light of Hughlings Jackson's Doctrines. (Hughlings Jackson memorial lecture.)

THURSDAY, August 1st.—9.30 A.M., Discussion: The Functions of the Frontal Lobe.

FRIDAY.—9.30 A.M., Discussion: The Hypothalamus and the Central Representation of the Autonomic System.

Notes, Comments, and Abstracts

A LADY COMPANION

Dr. Kathleen Vaughan writes:—"I have just made the acquaintance of Jinny, a chimpanzee of 18 months old, and brought up from birth by an Englishwoman, who lives near Daru in West Africa. Jinny seems to understand everything, is obedient and clean, and can fetch things when told. After having her hair trimmed she tries to use the scissors and comb for herself. She is affectionate and kisses her friends the dog and cat. She can wash her own face, cleans the floor with a damp duster, can open the door and gets on to a tricycle but likes to turn the pedals with her hands. A day or two ago she took a tablecloth, which had been hung up to dry, off the line, and brought it into the house, just before rain came—but we think this was a coincidence! When her mistress told her to give the dog half her biscuit she did so, but when he wanted her piece she put it in her mouth, showed it to him and then dodged behind the leg of the table, ducking her head when he came near. This went on for a long time: finally she let him take it from her mouth. She has been taught she must never take food and can only have it when it is given to her.

"Can your readers suggest a career for such a civilised little person, for here comes the sad part of the story. The owner has a young baby and cannot look after both charges. Jinny loves to help push the pram and kisses the back of the baby's head, but will probably be jealous of it. She must be sold. What is the best thing to do for her? Would Elstree take her, or a zoo where she could act as governess to young chimpanzees?

It has been ascertained that there are as many chimpanzees at Regent's Park as are wanted. Jinny is in Alderney at present with her owner, Mrs. G. Basham, to whom inquiries may be addressed."

THE RESTORATION OF THE CRYSTAL PALACE

ON Thursday evening, July 18th, H.R.H. The Duke of Kent visited the Crystal Palace to see the recently restored architectural courts. Many of these and the statuary, having been there for 80 years, had fallen into dilapidation, and in that state merited the general neglect received. Now, under restoration, the Crystal Palace has claims on public attention, apart from the well-known displays of fireworks. It is the only building in England possessing a whole series of courts, which illustrate architecture through the ages, and are built on a scale large enough to give a definitely realistic impression of ancient, mediæval, and renaissance art. The chief feature of the restoration is a full-size replica of the courtyard of a Pompeian house. This had been closed to the public for 25 years, but two years ago intensive restoration work was started by the staff of the Palace and the mural colouring and mosaic paving have been restored to their former brilliance. The Crystal Palace should again be numbered with the popular pleasure resorts of London.

ADDRESSES AND ORIGINAL ARTICLES

INFECTION AND ITS CONTROL IN CHILDREN'S WARDS *

BY E. H. R. HARRIES, M.D. Lond.

MEDICAL SUPERINTENDENT, NORTH-EASTERN HOSPITAL (LONDON COUNTY COUNCIL)

LECTURE II.

UPPER respiratory tract infections are ordinarily transmitted by droplet spray, but in the measles wards which were referred to in my first lecture there was no evidence of the occurrence of post-admission broncho-pneumonia amongst children adjacent to those admitted with that complication—there being 12 feet of wall space between cot-centres. Such cases as occurred, 39 amongst 1464 admissions of measles patients up to the age of five years, were quite haphazard as regards spatial distribution in the ward.

Upper respiratory tract infections differ greatly in their degree of infectivity. Virus diseases are the most highly infective and are very much more readily transmitted either by droplet spray or upon the hands of attendants than are bacterial infections. This is due in part, no doubt, to the minute size of the viral bodies and in part to the fact that some of the virus diseases are characterised, in their early stages, by sneezing and coughing. In some experiments upon the droplet dissemination of virus diseases Colvin [1] using bacteriophage as an indicator because it has numerous points of resemblance to viruses, found that sneezing was a hundred times more infective than coughing. The bacteriophage was demonstrated only in the droplets and thus was dispersed in exactly the same way as bacterial respiratory tract infections. That virus diseases may be most highly infective during the prodromal stages is particularly well recognised in the case of the common cold, measles, and chicken-pox.

1. *The Common Cold.*—Long, Bliss, and Carpenter [2] showed that the common cold may be infective to apes late in the incubation stage. They think it is improbable that masking of the infected person is a complete protection against dissemination and point out the possibility of the contamination of hands which, after having been scrubbed, have unconsciously been allowed to touch the face. Bliss and Long [3] showed that it was necessary for an infected person merely to prepare the food in the kitchen, taking no part in its distribution to the chimpanzees, this being carried out with the strictest aseptic precautions by others, to infect several of the animals with severe common colds.

2. *Measles and Chicken-pox.*—Considerable knowledge has been acquired as to the most infective phases and modes of dissemination of these two diseases as the result of the observations of those who have practised in fever hospitals the various methods of segregation founded upon the work of Grancher and of Hutinel in the children's hospitals of Paris with such later improvements of technique as were devised at the Pasteur Hospital opened in 1900.[4] [5] Grancher [6] in 1889, at the Hôpital des Enfants Malades, devised movable screens and adopted an antiseptic technique, and Hutinel,[6] in 1894, at the Enfants Assistés, contrived boxes or cubicles combined with antisepsis and asepsis in order to diminish the dangers which arose from the dissemination of infection amongst children aggregated in open wards. The conditions which they endeavoured to guard against were not the specific fevers but the "infections banales" of the respiratory and gastro-intestinal tracts.

Those who planned fever hospitals in the past failed to provide adequate isolation accommodation. Thus, fever hospital administrators, from the sheer necessity of accommodating those patients who, for one reason or another, it was unsafe to admit to ordinary wards, have been amongst the earliest to adopt the principles and practice of Grancher and Hutinel.

Thirty years ago, Gordon Pugh [7] by subdivision of three existing wards at the North-Eastern Hospital, first reproduced Hutinel's cubicles in this country and instituted a technique of aseptic nursing which is still carried out in the same cubicles which, however, are shortly to be replaced by new structures. Pugh found that measles and chicken-pox could not be nursed in these cubicles without danger of spread and this remains the case. In 1934 a total of 831 patients were admitted to the 34 cubicles contained in the three wards. Of these, 638 were suffering from infective conditions and 193 from non-infective conditions. Only 2 patients initiated cross-infection. They were each admitted in the incubation stage of chicken-pox and from each one case of that disease arose in another cubicle in the same ward.

Goodall [8] in 1910 divided a ward at the Eastern Hospital into completely separate chambers closely similar to those at the Pasteur Hospital. Even complete structural separation and an aseptic technique will not always prevent the transference of measles and chicken-pox from one chamber to another. A breach of technique may result in personal contact of patients or manual transference by the staff. Chapin [9] in his classical work on "The Sources and Modes of Infection" stressed the importance of personal contact and the manual transmission of infection and the relative unimportance of aerial spread. His work lent great support at the time to the experiments of Rundle of the Liverpool City Hospital, Fazakerley, who was evolving the system known as *bed isolation*. Crookshank,[10] it must be noted, had immediately prior to the appearance of Chapin's book introduced a similar system upon a small scale at the Barnes Isolation Hospital.

Bed Isolation

Bed isolation assumes an "invisible barrier" created by spacing and aseptic technique around *each* patient in the ward as distinct from the "barrier nursing" of one or more patients in the ward. Barrier nursing was introduced by J. Biernacki at the Plaistow Fever Hospital about 1908. Coloured bands or cords indicated in scarlet fever wards those patients who were to be regarded as potentially infective to other patients in the ward and who were, therefore, to be nursed "in barrier" with strict asepsis. Rundle and Burton [11] and Rundle [12] showed that patients suffering from a variety of infective and non-infective conditions might be nursed with a notable freedom from cross-infection in the same open ward providing that the "invisible barrier" surrounding each patient was scrupulously maintained. Thomson and Price [13] arranged a bed-isolation ward, the existing spacing of 15 *feet* between bed-centres being adhered to. They concluded that under the conditions obtaining in the ward, diphtheria and scarlet fever definitely, and mumps and rubella probably, were not air-borne. Measles, they thought, was air-borne early in the disease, and chicken-pox, intensely infective and air-borne in its early stages, was not infective after the third day from onset. Thomson [14] found that on two occasions in the same ward, under the same conditions, chicken-pox arose in patients separated by the whole length of the ward (90 feet) from the primary source; on three occasions when the distance was half the length of the ward, and on ten when the distance from the source was shorter. He believed that aerial transmission was the most likely mode of spread.

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* The Milroy lectures for 1935, delivered before the Royal College of Physicians of London.

Harries,[15] as the result of his experience in two bed-isolation wards in Birmingham, found that with neither 9 feet nor 12 feet of wall space could patients admitted in the prodromal stages of measles or chicken-pox be nursed without danger of spread. Between adjacent cots aerial transmission was possible, but over longer distances infection was much more likely to be conveyed by attendants. It was extremely unlikely, for example, that the virus of measles spread aerially in an oblique direction across the ward in a dosage sufficient to bring about simultaneous attacks in three children in adjacent cots upon the opposite side of the ward. Aerial transmission was an unlikely explanation of the mode of spread of the virus of chicken-pox through the whole length of a ward and a lobby to a corner cot in an adjacent division of the ward, intermediate susceptibles remaining uninfected.[15] (1924.)

Bacterial infections of the upper respiratory tract are much less infective than virus diseases. Glover [16] showed the conditions of spacing in sleeping quarters under which the meningococcus might be disseminated. Eagleton [17] found that in ordinary sleep this organism was not carried more than 5 feet. During violent coughing it may be spread three times this distance, a much shorter distance, he added, than in the case of many other organisms. A single act of sneezing or coughing may be sufficient to infect with the virus of measles a child in the next cot, but much more massive or more frequently repeated doses are necessary for the effective transmission of bacterial infections. It is notable how rarely whooping-cough, when introduced inadvertently in its infective phase, is disseminated in open wards with adequate bed-spacing, even when the patient is not nursed in in barrier. Thomson and Price concluded that the evidence of the aerial transmission of whooping-cough in their bed-isolation ward was not definite.

Experience with the cough-plate method of diagnosis shows that the plate must be held within 4 or 5 inches of the child's mouth when it is in the act of coughing, and even then the Bordet-Gengou bacillus is recoverable only in a proportion of cases. Kendrick and Elderling [18] obtained positive cultures from 78 per cent. to 84 per cent. of 207 clinically diagnosed cases of whooping-cough during the first three weeks of the disease; 39 per cent. in the fourth week and 0 per cent. in the sixth week. On the other hand, Macdonald and Macdonald [19] by the actual implantation upon the nasal and faucial mucosa of approximately 140 bacilli produced typical attacks of whooping-cough in two non-immune boys who had volunteered for the experiment.

Close contact, or the actual introduction of the causal organisms into the nasopharynx upon fingers or implements is necessary for the transmission of diptheria or scarlet fever. With 12 feet of space between cot-centres it is very unlikely that effective aerial transmission of bacterial infections occurs. It is doubtful whether it is possible for an enfeebled child suffering from broncho-pneumonia by repeated acts of coughing to produce a "velocity of infection," Dudley's term,[20] sufficient to infect in other than minimal doses the upper respiratory tract of another child 12 feet distant from the source and, a fortiori, of a child more remotely situated.

I believe that the post-admission complications which occurred in the measles wards referred to earlier in so far as they were not autogenous, resulted from relatively gross infection of the upper respiratory tract by means other than droplet spray. The grounds for this belief are that when children with bacterial upper respiratory tract infections are nursed in wards with identical bed-spacing, the additional safeguard of an aseptic technique being applied to each patient in the ward, spread of infection does not occur.

Adult Carriers

Of the three common viral infections discussed—viz., the common cold, measles, and chicken-pox—the last two may be ruled out as being introduced by adult convalescent carriers. Nearly all adults are immune to these two diseases as the result of an attack in childhood, and chronic carriers are unknown. Temporary contact infection of the nasopharynx, hair, hands, and clothing of adults may result in the transference of these diseases from one ward to another, and be the explanation of some outbreaks otherwise unexplainable. The common cold and similar "influenzal" conditions are undoubtedly introduced and disseminated by adults who enter children's wards in an infective condition. Crosbie [21] found that the masking of the staff in infant wards protected the patients from catarrhal infection, with the result that enteritis almost disappeared from those wards.

Spence [22] observed that the incidence of scarlet fever in his children's wards declined markedly when visiting was limited. Fever hospitals are exempt from mass visitations of parents. Visiting is strictly limited as to occasion and duration. Hooded gowns and a prescribed distance from the bed are insisted upon. Hands and face are washed before leaving the institution. Under such conditions it is unlikely that visitors to fever hospital wards play any important part in the transference in or out of the institution of purely bacterial infections, such as diphtheria or scarlet fever, but that they may introduce infections of the type of the common cold is more than probable.

The question of staff carriers is important. Joe [23] remarks that in isolation chambers nursing technique only operates to prevent infection between patient and patient, and the possibility of occasional staff carriers (of scarlet fever) must be borne in mind. He adds that the only methods of eliminating cross-infection from this source would be to adopt continuous masking or rigid bacteriological standards of freedom from infection, measures attended by insuperable practical difficulties.

Christie [24] found that nurses in pneumonia pavilions became temporary contact carriers of the pneumococcus but apparently without danger to themselves or others. My colleagues, Begg and Mair,[25] report that of a series of new entrants to the nursing staff at the North-Eastern Hospital during the autumn of 1934 who were swabbed before commencing duty for the first time in the wards, 56 per cent. harboured hæmolytic streptococci in the nose or throat, but in none were the organisms present in pure culture. If the nasopharynx was healthy, probationers, although harbouring the organisms at the time of beginning duty in the wards, soon lost them. If, on the other and, there was an abnormal or unhealthy condition f the nasopharynx, they tended not only to retain emolytic streptococci but to become profuse rriers or to develop streptococcal tonsillitis. No ntrant harboured diphtheria bacilli, and only one bsequently became a temporary (immune) carrier hile nursing diphtheria patients.

Cultures from the nose and throat of 173 nurses orking in various wards proved positive for the æmolytic streptococcus in 88 instances. Of these, he colonies were sparse in 54, numerous in 31, and in ure culture in 3 instances only. More than half he cultures showing numerous colonies and the only hree pure ultures were erived from urses attending carlet fever patients. Of nurses with healthy throats, 61·5 per cent. *returned negative results*, compared with 16·6 per cent. in the case of those with unhealthy nasopharyngeal mucosa. Clearly it is the nurse in the latter category who is potentially in danger herself and most likely to be a source of danger to others. Dr. V. D. Allison, of the Ministry of Health, kindly typed the strains recovered. They comprised 38 strains of the hæmolytic streptococcus, 19 of which fell into those frequently associated with tonsillitis, puerperal fever, and other hæmolytic streptococcal infections.

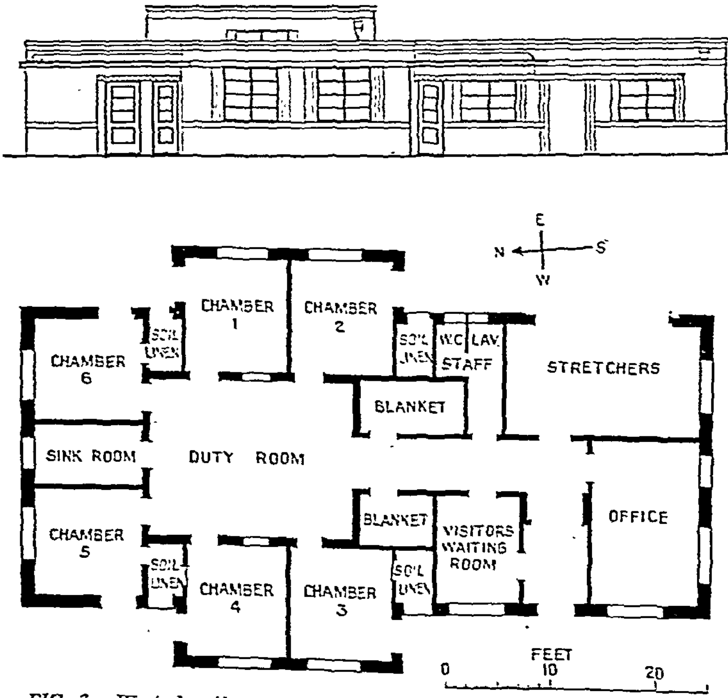

FIG. 3.—West elevation and ground-floor plan of new receiving block at the North-Eastern Hospital.

Control of Ward Infections

It is not feasible in the general children's hospital to eliminate entirely the danger of the waiting-room and casualty-room. The receiving-rooms of fever hospitals, to which children are brought by ambulance for confirmation of diagnosis and allocation to the wards, may be similarly dangerous, unless properly planned. When fever hospitals received, as such, only three notifiable infectious diseases—viz., diphtheria, scarlet fever, and enteric fever—small-pox being then, as now, admitted to separate hospitals, the single-chambers provided for each of these three diseases may have been adequate, but with the enlargement of the clinical field they are no longer so. In some provincial fever hospitals this fact has been recognised for many years, and receiving-rooms dispensed with, patients being examined, and allocated to wards, in the ambulance itself, a plan which has much to recommend it.

A receiving-room shortly to be erected at the North-Eastern Hospital will provide six separate chambers, *each* of which can be entered from the exterior and also from a central interior duty-room. The plan of this receiving-room (Fig. 3) and succeeding plans, are reproduced by permission of the medical officer and the clerk to the London County Council.

Preliminary Quarantine

Mackenzie[26] notes the tendency of children's hospitals in England to isolate young children for at least 48 hours *after admission* and, where accommodation allows, for several days. That preliminary quarantine, even for a few days, does operate to reduce the number of children admitted to the wards in an infective or *potentially infective condition* is the experience of Crosbie[21] at the Alder Hey Children's Hospital. Amongst 7746 admissions, 1276 children who were known contacts or who showed suspicious symptoms, were admitted to isolation blocks *for an average* period of 6 days. Of those so isolated, 35 per *cent.* developed some infectious disease. Preliminary quarantine, however, to be really effective, must be imposed upon all entrants for a period of three weeks, in order to cover the longest incubation period of the common fevers. Such a period is impossible as a general measure for hospitals receiving children suffering from acute illnesses; the institution would be disorganised. Nor, in such institutions, is it possible to impose quarantine, even for a limited period, upon *every* child admitted. (The circumstances of the long-stay hospital which receives tuberculous or rheumatic children differ entirely, for here universal and adequate quarantine may be practicable.)

Preliminary quarantine imposed even upon a limited scale must make great demands upon the available isolation accommodation, which is being increasingly used in both children's and fever hospitals for the segregation of patients suffering from infections other than the exanthemata.

Isolation Accommodation

A committee of the American Academy of Pediatrics[27] analysed the conditions under which communicable diseases of all types were nursed in 35 representative children's hospitals in the United States of America. The large number of these institutions which segregate in cubicles patients with respiratory tract infections, other than the specific fevers, is noteworthy. The recognition by fever hospital *authorities* that children with such conditions as broncho-peneumonia and otitis *media* constitute

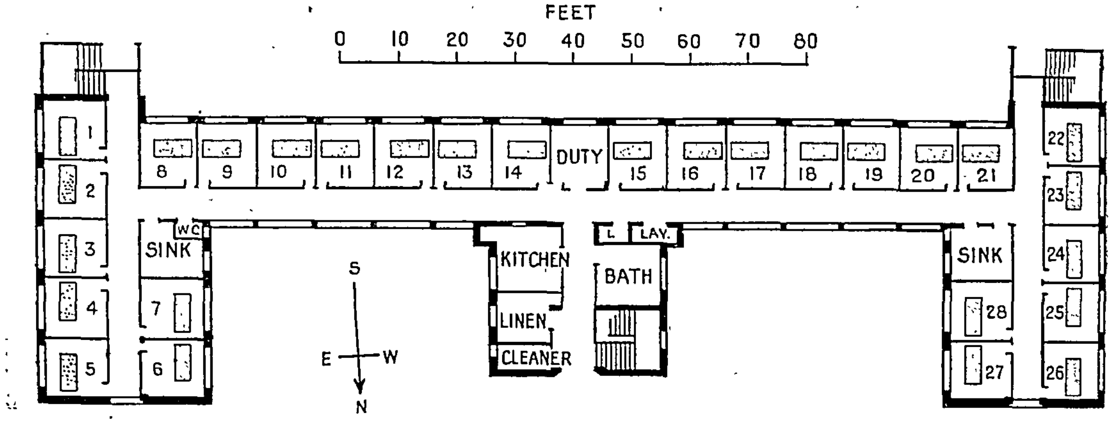

FIG. 4.—Ground-floor plan of one of two new isolation blocks. The stippled rectangles represent beds.

potential sources of infection when nursed in ordinary wards, unless indeed all are nursed in barrier, which is not generally practicable, has as a necessary sequel the provision of greatly increased isolation accommodation. In the fever hospitals of the London County Council this increased accommodation is being provided by the erection of two-storied blocks containing in each floor a large number of separate chambers.

In the plan (Fig. 4) of a floor of one of two such blocks, shortly to be erected at the North-Eastern Hospital, it will be seen that 28 separate chambers are provided. The two blocks will thus contain 112 single chambers or "wardlets."

It is neither feasible nor desirable to nurse every child in a chamber; the majority must and should be admitted to larger wards. Hence it is desirable to consider the conditions which should obtain in these wards in order that the dissemination of extraneous infection of any type inadvertently introduced may be reduced to a minimum.

Seventy years ago, Murchison[28] advocated for fever patients an allowance of 2000 cubic feet of air space, but he recognised that, however perfect the ventilation, "small-pox and scarlet fever will spread among persons not protected."

Although adequate ventilation is essential, the most important factor is not cubic space but space between bed-centres. The minimum standard of the Ministry of Health for fever hospitals is 9 feet between the edges of the beds, 12 feet between bed-centres, and 144 square feet of floor space. This standard is maintained in the infectious diseases hospitals of the London County Council and in newly constructed wards in the provinces—e.g., at Birmingham and Coventry. Those who have had experience of fever wards where this standard was not attained in normal periods and encroached upon in epidemic periods by the intercalation of additional beds, can be in no doubt as to its necessity. Overcrowded scarlet fever wards, for example, result in a greatly increased incidence of extraneous complications, such as, rhinitis and impetigo. An overcrowded ward implies overworked nurses who cannot perform routine nursing duties satisfactorily, while any attempt at barrier nursing which necessitates not only adequate spacing but rigorous aseptic precautions, cannot do other than create a false sense of security.

Mackenzie, in his survey, notes that the standards at present adopted for the accommodation of sick children in general or children's hospitals are 7 feet between bed-centres, a superficial area of 77 feet, and 847 cubic feet of air space. But it must be added that in children's wards, recently built or contemplated, the allowance of space between cot-centres is being steadily increased.

Liberal provision of small wards adjacent to the main ward and partial subdivision of the main ward itself by means of glass screens are outstanding features of recent design in both children's and fever hospitals. As representing this type the plan (Fig. 5) of one of a number of new wards shortly to be erected at the North-Eastern Hospital is reproduced. Within the subdivisions the beds are arranged in parallel, adjacent cot-heads being separated by a glass screen 7 feet high. Parallel spacing of beds is admittedly on trial. Various objections, such as difficulty of supervision have been urged. During the last measles epidemic the cots were arranged in parallel in a ward of the simplest "temporary" type at the North-Eastern Hospital. Twelve feet of space between

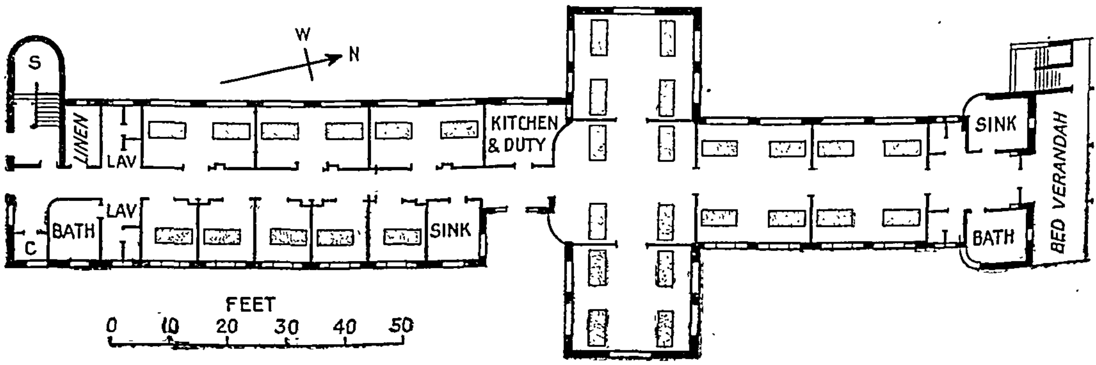

FIG. 5.—First-floor plan of a new ward block.

ot-heads was maintained, but, s the photographs (Figs. 6 nd 7) show, no glass screen ivided one patient from the ext. The results of the xperiment were entirely avourable. Draughts from he open windows were avoided nd supervision presented no ifficulties. The children were quite happy, making friends not with the next in line, but with those on the opposite side of the ward. The nurses were pleased with the arrangement. Owing to the fact that some 3 feet of space intervened between the wall of the ward and the side of the cot, access for nursing and cleansing purposes was easy.

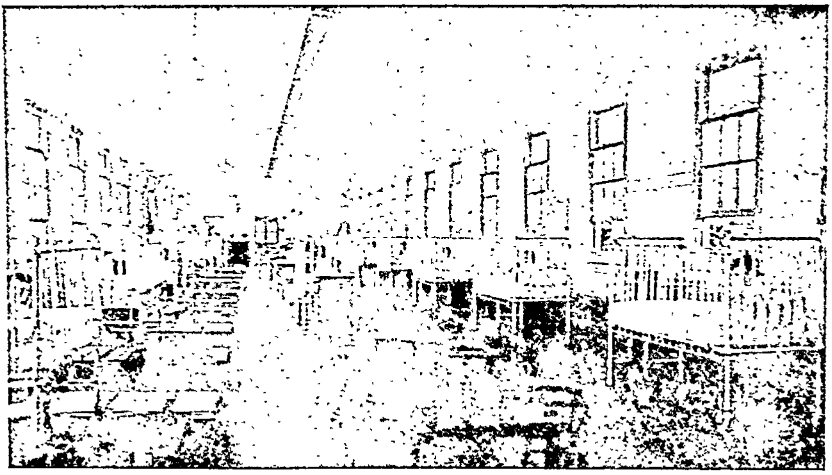
FIG. 6.—General view of ward.

The large open undivided ward which implies many children at risk from extraneous infections of one kind or another must be considered as obsolete. But such wards must nevertheless remain for some time to come in many institutions. Rebuilding is only possible as and when financial resources permit.

The Spread of Infection

It is wise to assume that in children's wards any one child is a potential source of infection to any other. Therefore, if it is necessary when complete physical barriers separate one child from the next, as in isolation chambers, to adopt in addition a technique of aseptic nursing for each child whether itself deemed infective or not, still more does this become desirable in the open ward where no physical barriers exist. It is true that under the present conditions of staffing this practice is ordinarily impossible of attainment, but it is nevertheless the ideal which should be kept in view.

As Nabarro and Signy[29] point out, nurses who feed children should not be those who attend to their stools. This subdivision of duties has been in force for several years at, for example, the Birmingham Babies' Hospital. But no nurse should give any sort of attention to a child without scrubbing her hands before proceeding to the next patient. Even if sufficient numbers of nurses were available this procedure is unlikely to be carried out unless there is ample provision of surgeon's basins with running water. The mere provision of numerous nurses and of facilities for hand-washing is useless unless the fundamental importance of surgical cleanliness of the hands is not only realised but ingrained in the nursing staff. It is unreasonable to expect a girl to acquire within a few weeks those principles of aseptic nursing, the application of which may be literally vital in wards containing young children.

In all wards, whether barrier nursing is employed or not, convalescent children are a source of trouble. In barrier wards, they may, unless constantly supervised, break the barrier and become infected. In ordinary wards convalescent children are also at risk of infection or reinfection amongst themselves. Schlesinger[30] has emphasised the danger of spread of epidemic throat infections amongst rheumatic children when up and about.

Reinfection is particularly likely to occur when convalescent diphtheria or streptococcal carriers are aggregated in open wards for the treatment of the carrier state. Even long series of negative swabbings may be interrupted by the return of a positive result. This may be due to true intermittency of the carrier state but, under the circumstances, is quite as likely to be due to re-infection. Thus Anderson and his co-workers[31] have been able to isolate the gravis strain of the diphtheria bacillus from convalescent carriers who hitherto had only harboured the mitis strain; which is strong presumptive evidence of reinfection.

Many diphtheria carriers believed to be intermittent are in reality reinfected contact carriers.[32] Some years ago I tried masking diphtheria convalescents with a view to avoiding reinfection. The results, as seen in earlier clearance, appeared to be promising, but practical difficulties such as the speedy damping and soiling of the mask with resulting excoriation

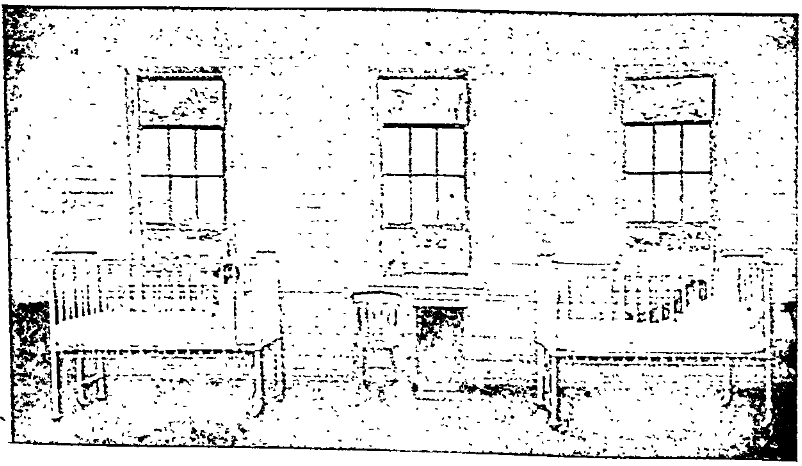
FIG. 7.—Beds spaced in parallel.

of the skin, and the necessity for its removal during meal times, led to the abandonment of the practice. The only satisfactory way to accommodate diphtheria or hæmolytic streptococcal carriers whilst their treatment, operative or otherwise, is in progress is in single or very small wards. In open wards carriers are frequently artifacts.

The limitation of the *spread* of a specific infection following its inadvertent introduction into a children's ward necessitates :—

1. Prompt detection and segregation of the probable primary source of infection.
2. Determination, so far as possible, of the number of immunes and non-immunes to that particular infection amongst the remaining children in the ward.
3. Protection of the non-immunes by such specific prophylactic measures as are available or feasible.

The primary source of infection may be obvious ; a child is inadvertently admitted in the incubation stage of, for example, measles or chicken-pox, and in due course develops a clinical attack. But if the time which has elapsed between admission and the development of the attack exceeds the longest incubation period of the particular disease, the primary source is either a child who has suffered an abortive and unrecognised attack, the "missed" case, or a carrier amongst patients or staff.

Amongst the viral infections atypical attacks of mumps such as solitary sublingual or submaxillary forms are easily missed ; and the occasional neurotropism of the virus of chicken-pox is now generally accepted. The occurrence of a ward outbreak of chicken-pox following the appearance of herpes zoster has time and again been within my own experience.

In the case of the specific bacterial diseases, the primary source may again be obvious, but if not, owing to the availability of bacteriological methods for the detection of carriers can usually be traced.

Determination of the number of immunes and non-immunes remaining may be impossible or may be effected with considerable accuracy. It may be necessary to rely upon the history of previous attack as indicating immunity, but the degree of reliability of such histories varies much with the disease. It is not great in the case of measles owing to the extent to which this disease is confused with rubella. It is considerable in the case of whooping-cough ; the attack has not only been unmistakable but of such duration as to impress it upon the mother's memory. In two conditions the evidence of immunity may be read upon the skin. The cicatrices of variola or vaccinia and of varicella are, as a rule, characteristic in distribution and appearance.

In diphtheria and scarlet fever direct methods for the determination of immunity are available in the Schick and Dick tests, but they must always be combined with a search for carriers, since it is amongst the immunes that the chronic carrier will be found.

Passive Immunisation

Passive immunisation is of proved value against three of the common specific infections—diphtheria, scarlet fever, and measles—and of doubtful or at least of unproved value against mumps and chicken-pox. The great advantage of passive immunisation is the rapidity with which it is brought about. Its disadvantages are two : the temporary nature of the protection afforded and the possibility, where an animal serum is the vehicle of provoking or initiating by the injection of foreign protein, either anaphylactic or serum phenomena.

Against two only of the diseases mentioned above —diphtheria and scarlet fever—are animal antitoxic sera employed ; human serum has perforce to be injected in the case of the others. Within recent years the process of concentration or refinement of specific animal antisera, by reducing their protein content, has resulted in a notable diminution of serum troubles of any kind.

Diphtheria antitoxin has been available for prophylaxis for forty years, since it was in 1894 that Roux and Martin announced its production. The prophylactic dose which consists usually of from 1000 to 2000 units protects on the average for three weeks.

Scarlet fever antitoxin, as such, resulted from the work of the Dicks and of Dochez, and has been in use for about ten years. The prophylactic dosage of concentrated serum ranges, as a rule, from 5 to 10 c.cm. The duration of the protection afforded, although varying with different batches of serum which cannot be standardised with the accuracy which is possible in the case of diphtheria antitoxin, ranges between 10 and 14 days.

Scarlet fever antitoxin is now widely employed for prophylaxis in both fever hospitals and children's hospitals. Recently, J. G. Fitzgerald [33] has reported that at the Toronto Hospital for Sick Children all patients who are shown to be Dick-positive reactors at the time of admission receive a prophylactic dose of scarlet fever antitoxin. As a result of the practice, the incidence of scarlet fever in that institution is stated to be only one-tenth of what it was prior to its introduction.

MEASLES

The value of the seroprophylaxis of measles by the injection of human convalescent or adult-immune serum is now generally recognised. Convalescent serum has been in routine use for several years in large fever hospitals. Amongst the earliest to use it in the wards of children's hospitals were Nabarro and Signy.[34]

Convalescent measles serum is difficult to obtain in adequate supply. Hence it is fortunate that the value of adult-immune serum has been proved. It was first employed, so far as this country is concerned, in the wards of the Birmingham City Hospital in 1929.[35] The results of subsequent trials upon a large scale in London have been set out in a report [36] of the medical officer of the London County Council. Although inferior to convalescent serum for prevention it has a value for attenuation as great as that of convalescent serum. The dosage of measles serum must be regarded as tentative. Different batches of pooled serum vary considerably in their protective value.

CHICKEN-POX

Various attempts have been made to protect exposed susceptible children against chicken-pox by the injection of convalescent serum. Blackfan, Peters, and Conroy [37] were successful as was Weech.[38] Gordon and Meader [39] also claimed a considerable measure of success. Schmidt,[40] on the other hand, failed. Gunn,[41] more recently, found that pooled varicella serum had a definite protective value—inferior, however, to that of convalscent measles serum in the same doses. Amies [42] has identified in the vesicles of chicken-pox elementary bodies similar to the Paschen bodies in small-pox and has demonstrated specific agglutinins in the blood of convalescents. He thinks it may be possible by means of the agglutination reactions to detect those sera which have a high antibody content, thus making selection instead of pooling possible. It is sincerely to be hoped that this, indeed, may be feasible, and that chicken-pox, the one common specific infection, which so far virtually defies all efforts at control, may at length become amenable to seroprophylaxis.

MUMPS

Similar suggestive results have been obtained in the seroprophylaxis of mumps by Hess,[43] Debré,[44] Regan,[45] Teissier,[46] de Lavergne and Florentin,[47] and by Gunn,[48] who thinks that the method is deserving of further trial.

Active Immunisation

In long-stay hospitals for children active immunisation against diphtheria of both staff and patients is practised increasingly often. So far as short and intermediate stay hospitals are concerned, active immunisation is ordinarily only applicable as an internal measure of control to the staff. Vaccination against small-pox, which is still insisted upon in most hospitals, and the inoculation with T.A.B. of those nurses who are attending to patients suffering from enteric group infections are well-established procedures.

Active immunisation of the staffs of fever hospitals against diphtheria was first introduced some 14 or 15 years ago at the Edinburgh [49] and Birmingham City Hospitals,[50] and is now adopted for the protection of the staffs of large numbers of hospitals of all types. Active immunisation against scarlet fever was also introduced several years ago in the same two fever hospitals [51] and, although not so generally practised, its value is undoubted.[52]

There is no evidence that active immunisation increases the carrier-rate amongst nurses. Although chronic carriers are always immune, the occurrence and persistence of the carrier state amongst the staff as the result of contact infections is, as was shown earlier in this lecture, closely connected with the existence of abnormal nasopharyngeal mucosa.

Conclusion

In these lectures the overwhelming importance of the upper respiratory tract as an actual or potential focus of infection has been emphasised. The problem of control of infection in children's wards virtually centres upon the upper respiratory tract.

Well ventilated, adequately spaced and subdivided wards with ample provision of isolation accommodation are essential. But no degree of architectural skill, no medical administrative measures, and no elaboration of technique can prevent entirely the transference of infection by human agencies.

The best-laid schemes may fail unless, in addition, the personnel is numerically and technically adequate to cope with the special dangers of infection which must inevitably attend the aggregation of children in hospital.†

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† In order to comply with the Council's standing orders it is necessary to state that the London County Council accepts no responsibility for the opinions or conclusions expressed by the author in these lectures.

DERMATITIS FROM DYED HAIR, FURS, AND FABRICS

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One of the recognised varieties of eczematous dermatitis is that in which a skin develops a specific hypersensitiveness towards one or more external agents which in themselves are harmless to the normal individual. The result of such idiosyncrasy differs in no way from ordinary constitutional eczematous dermatitis or from dermatitis due to non-specific hypersensitiveness and provoked by such forms of irritation as exposure, change of temperature, soaps, water, friction, or household chemicals.

Dye dermatoses are of this specific character. The reactions in themselves are not recognisable as forms of dye dermatitis—as was suggested in a recent medico-legal case—but the site of the eruption suggests hair, fur, or fabric dye as a probable cause. No final opinion can be given on these cases without investigation, and for this purpose the patch-test gives reliable and absolute evidence.

This test should be used as a routine in all cases of eczematous dermatitis in which specific sensitiveness to some external agent is suspected. A little of the suspected excitant—or more often a portion of lint moistened with a solution of the substance—is applied to the skin of the patient for 24 hours (or less if an active reaction is obvious). If the eczematous dermatitis is due to the substance of the patch-test, a positive eczematous reaction is seen at the time of removal of the test or within 24–48 hours, though it is wise to keep the subject under observation for longer than this if a negative result is to be accepted. If the lint becomes dry it should be moistened to ensure intimate contact. This is especially important in the case of dyed-fabric tests.

Experience has, however, taught me to use no more than one drop of a 1 per cent. solution of para-phenylenediamine in patch-testing a case of suspected hair or fur-dye dermatitis. If this is done the procedure will not be embarrassing.

INCIDENCE OF HYPERSENSITIVENESS TO DYESTUFFS

Hair and fur dyes.—In dye dermatitis it is commonly para- or meta-phenylenediamine, or allied substances, or one of their oxidation products, which is the external agent involved. In a previous communication the results of an investigation of the incidence of hypersensitiveness to para- and meta-phenylenediamine and their oxidation products were reported.[1] In this investigation 1000 patients were patch-tested with solutions of 1 per cent. para-phenylenediamine and with 1 per cent. and 5 per cent. solutions of meta-phenylenediamine, and it was found that about 4 per cent. of the patients showed evidence of hypersensitiveness, which was manifest at periods of 1–24 days after removal of the test. In the discussion upon these results the desirability of investigating a number of these cases by *repeated* test applications of the external agent was indicated and part of the purpose of the present paper is to describe an inquiry of this kind.

In all 45 patients were tested by repeated applications of a solution of 1 per cent. para-phenylenediamine. Of the 45, 15 were females and 30 males, of ages varying between eighteen and forty-five; 20 of these were normal subjects, 4 were known to be eczematous, 1 had suffered from urticaria and the remainder had lupus vulgaris. As in the previous investigation, the presence of some para-phenylenediamine in the patch-tests after the completion of the investigation, and the presence of Bandrowsky's base (indicated by blackening of patch-test and skin) showed that these, as well as intermediate oxidation products, had of necessity repeatedly come into contact with the skin of the patient investigated.

These patients, over 20 of whom had been patch-tested to para- and meta-phenylenediamine and were among the negative results in the previous investigation, were patch-tested with 1 per cent. para-phenylenediamine solution, applied daily to the upper arm by means of a linen and elastic cuff, for a period of approximately 12 hours, by day, and removed at night time over the course of a month. At intervals of a week the patch-test was resaturated with 1 per cent. para-phenylenediamine solution. In effect, the subjects investigated had a patch-test of para-phenylenediamine solution applied daily for 28–31 consecutive days, the tests, of course, being reapplied to the same sites each day. At the end of this period the applications were stopped and the subjects were kept under observation for a period of a month. In no case was any positive result recorded.

It was argued, in the previous communication,[1] that fur and hair-dye dermatitis are the result of idiosyncrasy in the patient, a view which is probably accepted by all dermatologists and in support of which there is abundant evidence. It would seem from this present investigation, that in addition to the fact that a very small proportion of normal subjects exhibit idiosyncrasy to these particular chemicals, hypersensitiveness is not readily provoked by the kind of repeated contact with these substances which ordinarily takes place.

Fabric dyes.—The very low incidence of dermatitis from dyed fabrics is an indication of the rarity of hypersensitiveness to these common dyestuffs.[2] On several occasions a dyed fabric which has provoked a single case of dermatitis has been patch-tested upon 100 normal subjects with negative results, and it has been customary in the skin department at the Leeds General Infirmary to use such fabrics as controls in making routine patch-tests. In no case has a positive result been obtained except in the case of the original sufferer.

DIAGNOSIS OF DYE DERMATITIS

In considering an eczematous eruption the points which suggest a dye dermatitis are the site, often an associated œdema, and the relationship of the onset to dyeing of hair, or wearing of a dyed fur or fabric. Sometimes the staining of the skin from dye dissolved out of a garment by sweat suggests this possibility, but it will be readily realised that none of these factors provide absolute criteria and usually the original diagnosis can be no more than tentative, to be confirmed or denied and corrected by subsequent observation and investigation.

Œdema, particularly affecting the eyes, is an important and common but not a constant accompaniment of dermatitis arising from the use of hair dyes and fur dyes. It is only rarely seen in any considerable degree in cases of fabric-dye dermatitis. In the latter the precise localisation of the eruption is much more valuable than in fur and hair-dye cases where localisation closely corresponds to that of seborrhœic eruptions and eruptions due to exposure to external irritation.

In the case of dyed frocks the limitation of the eruption to the upper trunk and arms where contact has occurred is often striking, the lower margins being defined by the upper limit of the petticoat and the skin lying under the shoulder straps escaping by an exact line of demarcation (Fig. 2). Another localisation of value and importance here is that of the axillary eruption which leaves the dome of the axilla clear, since contact occurs only below the axilla and round the axillary folds, whereas seborrhœic dermatoses show their maximum affection at the axillary apex (Figs. 3 and 4).

When eruptions are provoked by dyed socks, stockings, hat-bands, wristlets, &c., the limitations are usually suggestive. In the case of dermatitis from dyed shirts localisation may be less precise if that garment is worn next the skin, but the axillary eruption often gives the clue.

These affections commonly follow a first or early contact with the offending hair-dye, fur or garment, though it is well recognised that the development of specific hypersensitiveness may be considerably delayed. A patient may submit to the process of hair dyeing repeatedly over the course of many years before she becomes intolerant. It should be stressed, however, that there is no evidence to suggest that a reaction may be delayed longer than a certain period, probably a month, after contact has ceased.

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[1] Ingram, Brit. Jour. Derm. and Syph., 1932, xliv., 422.

Killick, E. M., and Ingram, J. T., THE LANCET, 1933, i., 77.

Dermatitis provoked by the phenylenediamines is more severe and acute than fabric-dye dermatitis and may give rise to secondary eruptions shortly after the onset of the initial affection or while that is subsiding. These are itching or eczematous dermatitis about the flexor aspects and flexures of the limbs, hands, and feet, or a toxic, morbilliform erythema with peripheral distribution, often widespread and distressing. It is difficult to determine whether these are manifestations of a general reactive eczematous sensitiveness, the skin acting as a single whole organ, or whether they are from absorption of inflammatory products of the initial eruption, or from absorption of the actual substances which have provoked the dermatitis. The latter seems probable since secondary manifestations may be present when the original disturbance has been relatively mild.

It is usual for patients suffering from dye dermatitis to recover readily when the cause is removed, but it must be recognised that the reaction may, for constitutional reasons, persist for months or years. Under such circumstances it is usually probable that if the dye had not done so, some other hazard would have provoked the constitutional breakdown or manifestations other than dermatological would have arisen.

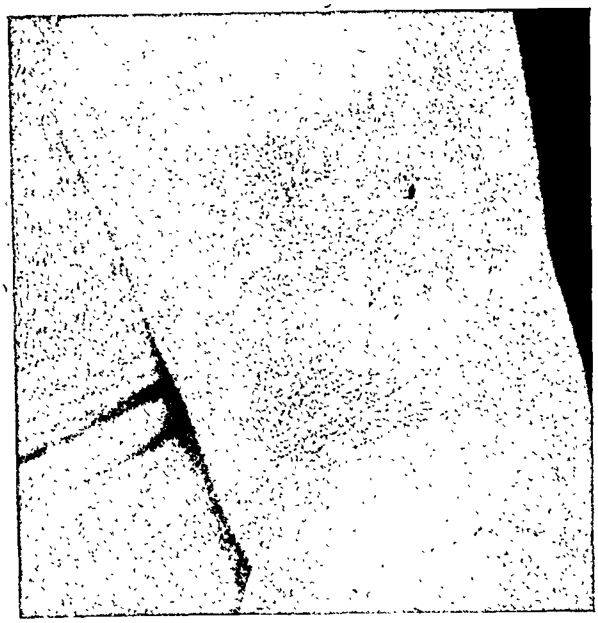

FIG. 1.—Positive patch-test reaction to 1 per cent. paraphenylenediamine in a case of dermatitis from dyed fur coat worn for four years.

Though a tentative diagnosis of dye dermatitis is commonly made, subsequent investigation and observation show that dye dermatitis of any type is rare. In a series of 8000 out-patients in the skin department at hospital I have seen no more than 16 cases of dermatitis due to dyestuffs. These figures do not include the occasional cases seen in dye-workers when numerous other factors enter into the ætiology, and it is rarely possible to attribute dermatitis to contact with dyestuffs alone. Of these 16 cases 6 were attributable to hair dyes, 3 to fur dyes, and 7 to fabric dyes, including 2 cases of dermatitis from the wearing of dyed khaki shirts. In a series of 4000 private cases 14 cases of dye dermatitis have been seen, 6 due to hair dyes, 4 to fur dyes, and 4 to fabric dyes. These figures may be relatively high because cases of medico-legal interest are specially directed to the dermatologist for an opinion; on the other hand it is probable that fewer cases are overlooked than in the rush of hospital practice.

Taking these figures together, 30 cases of dye dermatitis have been seen in a series of 12,000 skin cases, 12 from hair dyes, 7 from fur dyes, and 11 from fabric dyes.

Consideration of the private cases, to which greater care can be devoted, shows some points of interest and emphasises the constitutional eczematous background in these as in all dermatitis cases. In all but 2 cases there was definite evidence of nervous instability, marked in 4 cases and manifest in 1 case in a recent history of nervous breakdown. In many cases the phase of instability could be ascribed to recent experiences. In 2 cases the condition was associated with shock and was provoked by the wearing of black garments for mourning, though in neither case was the bereavement the only shock. One patient had been seen with lichen planus twelve months before her attack of hair-dye dermatitis and another was subject to urticaria. Two of the cases of hair-dye dermatitis were at other times subject to fabric-dye dermatitis though one case only was seen in eruption.

The frequency of the relationship of dye dermatitis to domestic, environmental, and psychological disturbances suggests that the reaction may be regarded upon occasion as in the nature of an associated conditioned reflex reaction. These points, while not disproving the specific nature of the sensitiveness to dyestuffs, suggest that a heightened general physiological sensitiveness, especially with nervous and dermatological manifestations, predisposes to specific sensitiveness.

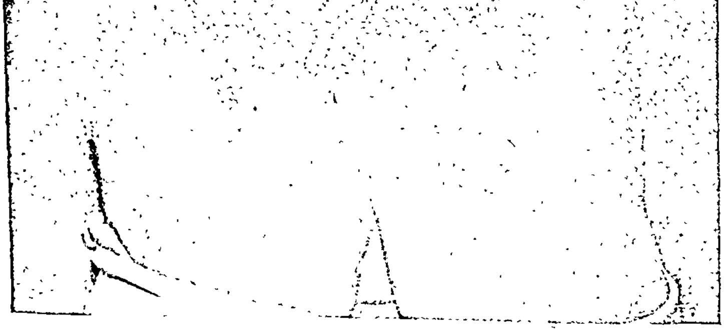

FIG. 2.—Distribution of fabric-dye dermatitis showing the eruption limited below by the upper edge of petticoat and not affecting the shoulder-strap areas.

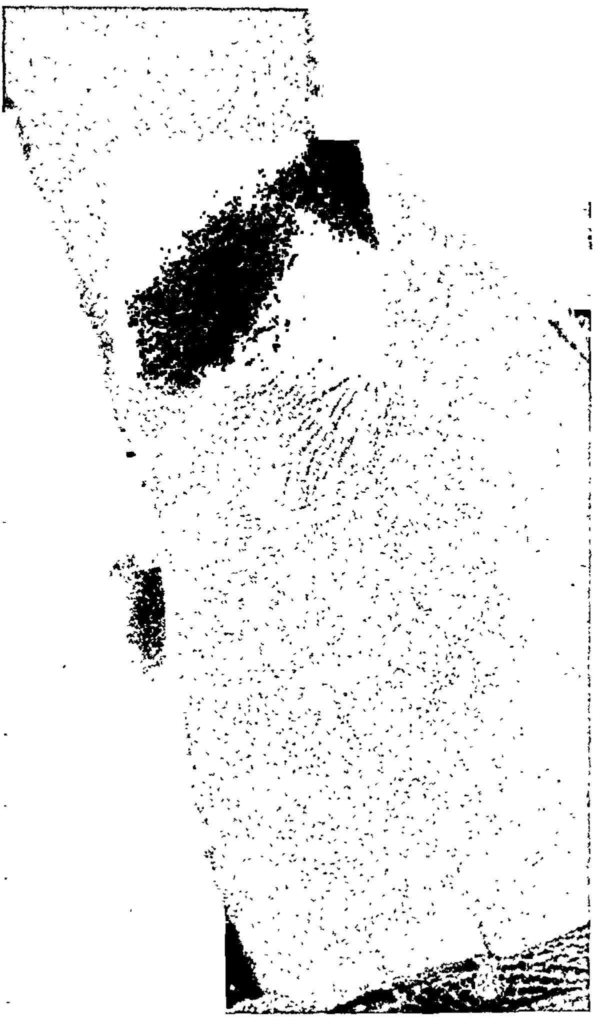

FIG. 3.—Axillary eruption in fabric-dye dermatitis (Case 4).

ILLUSTRATIVE CASES

The following cases illustrate some of the points to which reference has been made above.

CASE 1.—Mrs. A., aged 37, seen on Nov. 22nd, 1934, complained of an irritable eruption about the chin and neck of one month's duration. There was a scaling erythema of the sides and front of the neck and of the muzzle, limited above by the nasolabial folds. This was shown to be due to the wearing of a mole-coloured fur collar, black-tipped, and obviously brush-dyed. There was a marked positive patch-test reaction to the fur and to one drop of a 1 per cent. solution of para-phenylenediamine. The patient had not suspected this association. The fur was the only one owned by her. It had been bought two years previously, in September, 1932, had been worn each winter and had been worn this Autumn for about three months. It would be interesting to hear the judgment in such a case should the patient bring an action for damages.

CASE 2.—Miss B., a nervous patient aged 35, had used a hair dye (containing the phenylenediamines) three weeks before her visit. The following day she developed an eruption of her scalp which in three days was an acute, œdematous dermatitis of the whole head, face, and neck, with swelling of eyes, intense itching and malaise, and her hair was cut off. Within the following week a morbilliform erythematous eruption developed on the hands, forearms, thighs, eczematous in the flexures of elbows and axillæ. The trunk and feet itched and showed faint mottling. Two months later she was seen with an acute pompholyx immediately following the dyeing of a cushion.

CASE 3.—Mrs. C., aged 37, was seen with acute œdematous dermatitis of head, face, and neck, flexures of elbows and knees, breasts, buttocks, and feet. This had immediately followed dyeing of the hair (phenylenediamine), the patient having only had her hair dyed once, five years previously. Patch-tests to both para- and meta-phenylenediamine were embarrassingly positive. The patient was a highly neurotic Jewess, under aural and ophthalmic surgeons for nasal trouble and headaches. Some years previously she had an ovary removed. She had also been attending an out-patient physician for treatment of asthma but she gave no history of previous skin troubles.

CASE 4.—Mrs. D., aged 32, complained of attacks of itching, redness and swelling of the armpits over the course of three months, associated with the wearing of a green frock which had been dyed black. There was the acute, eczematous, saddle-shaped dermatitis of axillæ shown in Fig. 3, which completely avoided the apex of the axilla. A patch-test of the dress applied on July 29th, 1932, gave an acute positive reaction on July 30th, which was still recognisable a fortnight later. The patient perspired freely, and it is to be noted that the eruption only occurred at the sites of moist contact.

CASE 5.—Mrs. E., aged 46, presented an itching, scaling, erythematous eruption of upper chest and arms of four months' duration. The skin protected by the under-garments was not affected, but the patient had not suspected the cause of her eruption. She was therefore patch-tested against all her frocks—two flowered fabrics, one check, one light grey, and one black. She gave a marked positive reaction to the black fabric only and the eruption cleared following removal of the cause.

Black, brown, and khaki fabrics appear to be the commonest causes of this type of dermatitis.

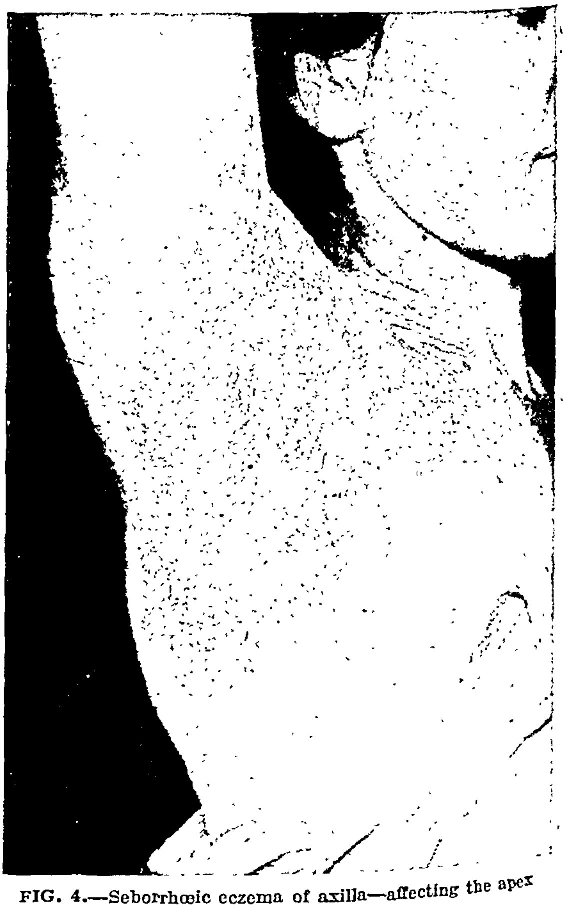

FIG. 4.—Seborrhœic eczema of axilla—affecting the apex

SUMMARY AND CONCLUSIONS

No clinician could seriously suggest that the reaction of hair or fur-dye dermatitis or of fabric-dye dermatitis was not due to idiosyncrasy. The clinical evidence is support of this view is abundant, while the alternative suggestion that such conditions are due to an irritant substance (using the term irritant in the ordinary sense to mean something irritant to the majority of normal persons) serves only for purposes of legal argument and cannot stand up to serious clinical investigation. The workers in the dye industries are not subject to more dermatological troubles than other trades—whereas the irritant theory would make this industry an impossibility in practice.

The patient suffering from hair-dye dermatitis has often had exactly similar treatment on other occasions, and the same treatment is being carried out without ill-effect upon hundreds of other people. A patch-test in such a patient will produce an embarrassingly positive reaction, while the same patch-test in other subjects gives a negative result. The sufferer from fur-dye dermatitis can give her fur to a hundred other persons to wear and they will suffer no harm. The patient with fabric-dye dermatitis can be similarly generous with her offending dress without fear of provoking dermatitis and she is wearing material treated with dyestuffs which are in contact with the skins of thousands of individuals and are serving their legitimate purposes without injury.

Dye dermatitis, like plant dermatitis, or light dermatitis, and an infinite variety of other sensitisation reactions, is exactly analogous to urticaria produced by sensitisation to eggs, or to asthma resulting from sensitisation to roses. Most medical authorities probably appreciate this, if they do not always preach it; but it would mean the saving of enormous sums of money, of invaluable time and of much unnecessary ill-health if legal authorities could be persuaded to accept it. It is probably too much to hope for this until there has been a complete revision of the Workman's Compensation Act, in so far as it is related to dermatitis arising from "irritant dusts and liquids," and it is probably true that our terminology, often misleading in its dogmatism, prevents patient, doctor, and lawyer from viewing the subject in true perspective. The terms eczema, dermatitis, and eczematous dermatitis have been used as interchangeable terms in this paper for it is fundamental that the conception of any distinction between eczema and dermatitis should be broken down.

PROCTALGIA FUGAX

A LITTLE KNOWN FORM OF PAIN IN THE RECTUM

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Last summer I was consulted by a colleague about pain in the rectal region, of which, although a diligent reader, he was unable to find any description in the literature to which he has access. It thus acquired a mysterious character, which added to his anxiety.

Case 1.—The doctor referred to, who was 59 years of age, had always been in good health apart from the ordinary diseases of childhood. He had lived in St. Croix for a couple of years, but had never suffered from any tropical disease. He was able to eat all kinds of food and had no trouble with his bowels unless he drank much coffee, when the motions were rather loose. For three or four years he had suffered from quite unexpected pain without any suggestion of periodicity, which he referred to the rectum, always in the same place a little above the sphincter ani, but how far up he could not tell. The pain was not radiating; it appeared quite suddenly at intervals of days or months when least expected, generally in the daytime. It only occasionally awakened him in the night. It was described as gnawing pain, slight at first but increasing steadily to a considerable degree of severity, so that he had to lie down. He felt ill during the attack, but did not know whether he became pale. It disappeared quickly leaving behind no ill-effects whatever apart from some lassitude. The attacks were said to last for about two minutes.

I found nothing abnormal at the usual examination; a rectal exploration proved that everything was normal except that the sphincter ani was rather tight, which was due probably to the discomfort of the examination.

I had to confess to my colleague that I myself had not seen any report of these attacks of pain, but I was able to inform him that they were well known to me and gave him a description of them which he said corresponded with his own attacks. I have met with this pain a dozen times or so in my practice, but as I do not keep a card index of the diseases of my patients I can find the notes of only two cases treated during the last few years.

Case 2.—A man, 47 years of age, previously healthy, was treated at St. Elisabeth's Hospital in 1928 for gastric ulcer (melæna). He had since had periods with slight symptoms of ulcer and some tendency to constipation. For at least ten years—that is, several years before the gastro-intestinal trouble occurred—he had been subject to quite unprovoked attacks of pain at intervals of some days or several months, which he referred to the rectum a little above the anus. The pain was always in the same place, it was not radiating but had a gnawing character and in the course of a few minutes became extremely violent, after which it quickly subsided. At the height of the attacks he often felt a kind of pulsation in the rectum. The pain was so violent that he could do nothing during the attack, but had to keep absolutely still or throw himself on to a sofa or chair. He became pale and cold, perspired, and at the same time was conscious of a tight sensation in the precordium or epigastrium which made him gasp for breath and gave him the impression that he was gravely ill. At first he always had only one attack, but later, two, following closely upon one another. They occurred generally in the morning, more rarely later in the day and were then less violent.

When the attack was over he felt perfectly well, though a little tired. The pain had no connexion whatever with meals or the state of the bowels, and was only occasionally associated with hard motions. He had consulted several doctors about these attacks, but examination never revealed anything abnormal—no hæmorrhoids or fissures; nor was I able to demonstrate any place in the sigmoid, rectum, or anal canal from which the pain could arise. Rectoscopy showed nothing abnormal. The attacks of pain had not prevented him from working and had become less frequent in the last few years. The patient is the director of a big firm.

Case 3.—A married lady, 39 years of age. Treated in 1934 at St. Elisabeth's Hospital for bronchial asthma, bronchitis, and myalgia dorsi. For several years she had typical bronchial asthma as well as myalgic pains in back and chest. Lately, somewhat depressed and inclined to crying. No dyspepsia; bowels open daily, spontaneously. Rectovaginal examination revealed a retroflexed uterus and a slightly enlarged cystic right ovary.

For at least five or six years the patient is said to have suffered from sudden and inexplicable pain which she referred to a point about 10 cm. up in the rectum, definitely not to the anal ring, and always in the same place. The pain was convulsive in nature and increased steadily to a maximum, when she felt violent tension in the entire pelvic region. She grew pale and perspired and also felt a dragging sensation in the precordium or the upper part of the epigastrium which left her breathless; she often fainted in an attack. The attacks were soon over, but she could not tell even approximately how long they lasted. She would say: "I do not know, but I suffer terribly while they last." On another occasion she said that they lasted at least ten minutes. The attacks occurred very irregularly at intervals of days or several months; the last severe attack was experienced about eighteen months previously, since when she had only had abortive attacks. She felt well after the attacks apart from lassitude, often very pronounced. She could not suggest any reason whatever for the occurrence of the attacks; at any rate they have no connexion at all with the state of her bowels.

Examination of the alimentary canal showed nothing abnormal apart from some atrophy of the skin round the anus; she had been suffering for a few years from pruritus ani. There were no hæmorrhoids or fissures. Rectal exploration and rectoscopy (30 cm.) disclosed nothing abnormal. She thought that the pain was located round the sigmoid flexure. It was impossible to find any point from which the attacks could have started. The spinal fluid was normal. Wassermann reaction negative.

In my experience these attacks of pain occur both in men and women. All my patients have been adults, and except two they all suffered from some gastro-intestinal disease for which they sought my help.

FEATURES OF THE ATTACKS

The characteristic features of these attacks are :—

1. Their quite unaccountable occurrence when the patient is in perfect health. They appear at very irregular intervals at all times of the day and night.

2. Their spontaneous disappearance without leaving behind any ill-effects except a quickly passing lassitude; more important still, they are not followed by disturbances of the intestinal function (constipation or diarrhœa).

3. The localisation of the pain in the rectal region above the sphincter ani, always at the same place in the same patient, but varying somewhat in different patients.

4. Their severity. In one of my patients, an otherwise healthy man, they had become so frequent and violent that he had discussed with a surgeon the possibility of having the nerves to the intestine severed. Another of my patients (see above) had fainted during the attacks. Mild attacks or abortive ones may however also occur.

5. Their short duration. In most of the cases the pain lasted only a very few minutes. One of the patients said however that it lasted about ten minutes (Case 3). In the same patient the duration of the attacks seems almost constant.

6. The pain is described as gnawing, aching, cramp-like, or stabbing and is often associated with a characteristic tight sensation in the epigastrium or precordium, which makes the patients gasp for breath and gives them the impression of being gravely ill. It is neither preceded by nor followed by tenesmus, nor by flatus or paræsthesia in the rectum or anal region, and it is very seldom of a radiating character.

As a rule the patients had had the pain for several years and could give no conceivable reason for its occurrence, nor was I able to associate it with any definite disease. One of the patients suffered from gastric ulcer, another from colitis with dyspepsia, one from bronchial asthma, and one man was otherwise in perfect health. On some of the patients dilatatio ani violenta had been performed without any relief whatever. One woman was operated on for a retroflexed uterus without result.

I have carefully examined all these patients, except the colleague referred to, including rectoscopy and rectal exploration, but always with an entirely negative result. I have not been able to find any change in the anal region, rectum, or accessible portion of sigmoid flexure which might explain the origin of the pain. I have unfortunately never been able to examine the patients during an attack. But perhaps an examination would be impossible at such a time.

NATURE OF THE CONDITION

The negative result seems to indicate that the pain is of nervous origin. The attacks have nothing in common with the pain associated with anal fissure, hæmorrhoids, coccydynia, or proctitis; they are not associated with tenesmus, nor are they caused by defæcation.

If we assume, and this is the most reasonable explanation, that these attacks of pain have a nervous origin, the question arises whether we can place them among any of the known forms of nervous pain in the rectum—the organ which is clearly the seat of the pain. I have found no mention of it in the Danish, English, French, and American text-books and monographs to which I have access. In 1907 Albu described 5 cases of rectal neuralgia (Mastdarmneuralgie), and stated that the American investigator, S. G. Gant, had given a detailed description of this complaint in his book on diseases of the rectum and anus (published in 1904), a book which I have failed to obtain, but I shall revert later to Gant's description of rectal neuralgia. According to Albu's description—he says that he has been unable to find any mention of it in the German literature—rectal neuralgia is characterised by pain which is intermittent or remittent and located in the rectum from which it radiates to the hip, perineum, and sometimes even down the legs. The duration of the pain varies greatly, from minutes to days, and may recur several times a day.[1] The pain had no relation to defæcation or functional intestinal disorders (constipation or diarrhœa) and occurred in decidedly neurasthenic individuals. Unfortunately Albu does not give the history of his cases, but mentions one where "the rectal neuralgia" was due to cancer of the prostate and was therefore not genuine rectal neuralgia. I will give a brief summary of the history of this case:

A man, 55 years of age, had suffered on and off for several months from violent pain in the rectum and perineum, which at times spread out into the back, but mostly into the right hip and thigh. The pain varied in intensity and could disappear completely, but might be so violent that the patient had no peace by day or night. The pain can therefore be very protracted.

Albu further states that tabetic anal crises can resemble what he understands by rectal neuralgia; I shall return to this point later. Pickardt reported 2 cases of nervous rectal pain, occurring after rectal gonorrhœa, and pointed out the analogy with Albu's rectal neuralgia. It has nothing in common with the attacks of pain we are dealing with, but resembles closely the neurasthenic rectal pain. In A. D. Schmidt's "Klinik der Darmkrankheiten" (1913) neuralgia of the rectum is described as follows: "Wenn wir von den bereits erwähnten Crises anales der Tabiker und der Coccygodynie absehen, kommen neuralgische Schmerzen des Rectums und der Anusgegend nicht allzu selten vor. Sie gehen aus den Hyperæsthesien und Paræsthesien dieser Gegend hervor und kombinieren sich mit ihnen." In his work "Constipation and Allied Intestinal Disorders" the American author S. G. Gant, referred to above, cites some cases of rectal neuralgia in constipated patients, which in no way resemble proctalgia fugax, but correspond far better to Albu's description of rectal neuralgia.

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[1] The fact that Albu was able to examine his patients during the attacks points to their lasting much longer than those reported here.

There can hardly be any doubt that the rectal pain described by Albu, A. D. Schmidt, Pickardt, and Gant is the same disease. The common characteristic feature of the neuralgia—namely, the intermittent and remittent occurrence of *radiating* pain—is easily recognised from Albu's description. A. D. Schmidt, on the other hand, lays more stress on the paræsthesia and hyperæsthesia so often associated with the neuralgic pain than on the pain itself. The clinical picture briefly described by him corresponds, according to my experience, to the frequently occurring nervous rectal pain. It usually has more the character of paræsthesia and is described as gnawing, burning, or smarting pain which radiates from the rectum to the perineum, genitalia, or sacral region. And although it varies in intensity, its almost constant presence and its resistance to treatment are just the things which make these patients the perpetual despair of many doctors. A patient whom I recently treated for such nervous rectal pain, who was a pronounced neurasthenic, gave it a rather characteristic name—"smouldering pain"—by which he meant that the pain was not particularly severe, but felt like a continuous gnawing in the rectum, spreading out to the genitalia, but of variable intensity.

From the description I have given of proctalgia fugax it is clear that the clinical picture of this disease is quite different from that of rectal neuralgia.

Albu states that rectal neuralgia can be confused with the anal crises in tabes. Lewandowsky gives the following brief description of the latter: "by rectal crises are meant attacks of pain in the rectum associated with a sensation as if a wedge had been shot into the anus." Pierre Marie (Charcot, Bouchard, and Brisseau, Traité de Médecine, 1904) describes the intestinal crises in tabes as being attended by diarrhœa, rectal tenesmus, or hæmorrhage from the anus. Quite apart from the fact that none of the present patients were tabetics or that I have any recollection of any of my other patients being such, proctalgia fugax bears no resemblance to either Lewandowsky's or Pierre Marie's description of anal or intestinal crises in tabes.

But in addition to this nervous rectal pain yet another form of nervous abdominal pain is described under the title "nervous enteralgia or neuralgia of the mesenteric plexus." I have only seen this variety of pain described in German manuals and textbooks (Nothnagel, Strassburger, A. D. Schmidt), never in the Danish, French, English, or American books which have been available to me. Nervous enteralgia, which in earlier days played an important rôle (see Romberg: Lehrbuch der Nervenkrankheiten, 1846), has of later years lost considerable ground. And A. D. Schmidt writes: "selbständige ätiologisch auf andere Weise nicht zu erklärende nervöse Enteralgien habe ich selbst nie beobachtet." I must refer to Strassburger's and Nothnagel's descriptions of the nervous enteralgia which consists of attacks lasting for a longer or shorter period (days), radiates, and is often preceded or followed by slight abdominal pain. The term nervous enteralgia is undoubtedly a scrap-heap, and the attacks of pain described by the above-named authors either include pain in other parts than the intestine—e.g., duodenal or gastric ulcer—or they are the spasmodic pain of spastic constipation, mucomembranous colitis, or lead colic, which are probably due to intestinal spasm. Proctalgia fugax quite lacks the radiating character which these attacks of pain mostly possess, while the abortive attacks are entirely absent before and after the actual severe attack which is of much shorter duration.

It has thus been impossible to find any description which would fit this disease. That it is of nervous origin, is, as already suggested, probable, and it seems most likely that proctalgia fugax is caused by a spasm. This spasm cannot occur in the sphincter ani—even if such a purely functional spasm of this muscle exists at all. Nothnagel maintains that anal spasm is always secondary. The present patients and, as far as I can recollect, all the other patients I have seen, were absolutely sure that the pain was situated above the anal region. The pain in this region is indeed quite familiar to most people and sufficiently characteristic to be identified. If therefore proctalgia fugax is due to spasm, it must be located in the rectum above the anal region or in the lowest part of the sigmoid flexure.

The course of the disease varies very considerably. One patient, an otherwise healthy woman, told me that she had had three attacks in the course of one year; subsequently she felt no trace of pain until many years later when she had a severe attack accompanied by profuse sweating. Other patients suffered for years from attacks which then ceased for a long time, but I have formed the impression that they become less frequent and milder as time goes on.

The *ætiology* of proctalgia fugax is quite unknown; in fact we cannot even determine with certainty whether the pain is primarily nervous or reflected. I think I can say definitely that none of the abovementioned patients were neurasthenics.

It is of course difficult to devise a *treatment* for attacks of pain of such short duration and of such varying frequency as proctalgia fugax. One would naturally regulate the function of the intestine if it was out of order, ut aliquid fiat, and if the pain occurs fairly frequently an attempt might be made to stop it by giving belladonna, luminal, or codeine. Most of the patients I have seen have been content to learn that the attacks of pain were not a sign of any serious illness and did not lead to any.

I propose to call this morbid condition "proctalgia fugax." I am aware that it is a philological heresy to couple a Latin adjective with a Greek substantive, but for one thing it is a very common combination in the names of medical diseases—e.g., erythema fugax—and moreover the term has the advantage that it does not suggest any particular origin of the pain. When asked why I call these attacks of pain proctalgia, I can only answer that it is because the patients themselves refer the pain to the rectum. Moreover, I cannot think of any other organ in the pelvis, common to both sexes, where the pain might be located.

Addendum

Since the publication of my first account of proctalgia fugax in *Hospitalstidende* (1935, No. 3, p. 73) six colleagues have published or informed me privately of their personal experiences. I shall cite some of these cases.

Dr. A. B., aged 42, writes: I have searched in books and asked other physicians about it, but nobody has been able to tell me anything about this perplexing affection with which I have been troubled for the last 6–7 years—fortunately, less often during the past year. Your description of the condition is excellent, but I would like to add a few remarks about my own case. The first attack set in at night after coitus. Since then the pain has again appeared a few times after coitus; but otherwise it sets in without any provocation whatever, most often at night. I have been sound asleep and suddenly I wake up, feeling this excruciating pain in the rectum: at first faintly, then gradually increasing to an agonizing strain which may be so violent that once I fainted from it. I cannot say that the pain is accompanied by a need of defæcation, yet it feels as if I might be relieved if the bowels would move because the rectal strain or pressure is so severe. After the pain has lasted some minutes, it begins to subside and finally disappears, giving way to a state of fatigue coupled with profound gratitude for the end of the agonising minutes. These attacks were never followed by defæcation, nor by urination.

After the first attack it was natural to think of a spasmodic condition of the prostate, but rectal exploration has revealed no abnormality. Nor, as a rule, have I been able to think of any exciting cause of the attack. When it is at its height I feel a longing for a rather hot soapsud enema, but then there is no time to get it ready or do anything. At first I used to go to the w.c. whenever one set in, but as there was no passage of fæces, flatus, or urine, and since I once fell on the floor in a faint, I now lie flat on my back in bed. As regards constitution, I may tell you that I am rather easily upset, and that I have a disposition to migraine and to "neurosis," sometimes cardiac and sometimes gastro-intestinal.

Dr. C. D., aged 47, writes: I have been much interested in reading your paper on proctalgia fugax, a condition my mother and I are painfully acquainted with; I have been troubled with such attacks for about ten years. In both my mother's case and my own the attacks set in most often at night, so that we wake up with pain. Then the pain increases in intensity till it reaches a climax, after which it again subsides. It lasts from 10 to 15 minutes and is always in the same place. The pain is very distressing, so fierce at its height that one is almost crazy with it. I turn pale and sweat profusely. I have tried to examine my rectum during the attack but I have been unable to feel anything wrong. In the last attack the pain began in the left side and passed *in front* of the rectum over to the right side, while *it subsided in the left side*. I have never noticed such a passage of the pain before.

All treatment has been without any effect. I have tried defæcation, hæmorrhoidal ointment containing percaine, digital massage, but all without avail. My mother sits down on the edge of a hard chair and thinks it helps. The attacks have come twice or thrice a year except for one year when they stayed away altogether. I have twice had a sensation of an approaching attack in the daytime but it kept away. For the sake of completeness I may tell you that I have a small fissure of the mucous membrane that bleeds a little now and then, but it never hurts, and it does not appear to be in any way connected with the attacks. Nor are the a ks associated with any disorder of the bowel.

Dr. E. F., aged 70, writes: Proctalgia fugax! Fa whent —now I know a fine name for an affection I h em been acquainted with personally for a good many ye recearly always at night and not with such violent manif esthus as encountered in some of your cases, but disagre om ough whenever it makes its appearance, fortun long intervals. You are right, it has nothing t the anal opening; it seems to be located higher u or sond it feels more like a spasm. If I am to compar on fo with anything else it will be with cramps of the with with which I am troubled with now and then—tho ered it has no connexion with the proctalgia. dysp

I just wonder whether this phenomenon—or was atever one should call it—will not turn out to be rath ne pa ommon now you have drawn attention to it. I have ned w t twice in my practice; I do not remember any de operat of one of these cases, but the other patient was a fo sailor, 50 years old, who described the pain as being eedingly severe. ese p

The information now available on ng rec, whole confirms my description of proctalgia h an ax. But the attacks may evidently last conside e to ly longer than I stated at first, for a colleague of m or a estimates the maximal duration at one hour. T ht ex uggestion that the pain may be relieved by chang unate posture is new to me: one patient is relieved by ring a ng flat on his belly, another on his back, and a third on his side. Moreover, among the latest additional cases, there are two instances in which proctalgia fugax has occurred in the mother or father and in the child.

Another important point is now elucidated more fully. I stated above that the attacks of pain can scarcely be attributable to anal spasm. This view is confirmed by three of the patients who have explored their rectum during the attacks without being able to feel any spasm of the anal region. The only positive finding was that one patient thought he was able to detect some swollen veins in the rectum.

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THE TREATMENT OF TETANUS WITH CONTINUOUS AVERTIN ANÆSTHESIA

WITH A REPORT OF A CASE

BY LESLIE COLE, M.D. Camb., F.R.C.P. Lond.
HON. PHYSICIAN TO ADDENBROOKE'S HOSPITAL, CAMBRIDGE

IN tetanus, treatment should be directed along three lines:—

(1) The prevention of any further absorption of toxin by the central nervous system. (2) The control of reflex spasms, which kill by exhaustion or by respiratory spasm and suffocation. (3) The giving of sufficient fluid and food.

Further absorption of toxin which is already present in the wound or in the circulating blood can probably be prevented by giving a large intravenous dose of antitoxin (100,000 to 200,000 international units), and after an interval cleansing or excising the wound. It is not likely that anything can be gained by giving repeated doses of antitoxin. Cole and Spooner[1] have shown that after a single injection of 200,000 units there are still over 10 units per c.cm. in the blood seven days later and 3–5 units per c.cm. fourteen days later. There is no convincing evidence that the injection of antitoxin by the intrathecal or any other route can effect toxin which has reached the cells of the central nervous system. Both theoretical and clinical evidence suggest that the intravenous route is best for neutralising toxin which is still circulating. Lumbar puncture is to be avoided at all costs.

Many drugs have been tried for the control of reflex spasms. Avertin was used in 1928 by Lawen[2] and Lindemann.[3] Momburg and Rotthaus[4] in 1929 gave 63·8 g. during a period of twelve days to a child weighing 20 kg., and were of the opinion that the relief afforded in this case by Avertin during the acute stages of the illness was greater than they had ever witnessed from other sedatives in similar conditions. Since then, many clinicians have given favourable reports of its action.

I have used avertin in 10 cases of tetanus since 1930[1, 5] and have found it better than any other sedative. In severe cases, doses of 0·1 c.cm. per kg. control the reflex spasms completely for periods of from two to six hours and produce relaxation of the jaw and lessening of the tonic rigidity. No ill-effects have followed the above dose given daily for eight consecutive days, and four such doses in 24 hours have given rise to no ill-effects. In no previous case, however, have doses approaching that used in the present case been given.

CASE RECORD

Baby A., aged six and a half days; second child; male. Labour normal. Weight at birth 7 lb. The cord separated on the fifth day after birth. It was dressed with cotton wool before separation and "rag" afterwards. Progress was normal and he took the breast well until six and a half days after birth. It was then noticed that he could not suck and that the jaws seemed to be stiff and the mouth could not be opened. Twelve hours later he was still unable to suck or swallow and he appeared to be stiff in spasms. These symptoms became steadily worse, and he was unable to take any food up to the time of admission to hospital, 36 hours after the onset, when he was 8 days old.

State on admission.—Marked physiological jaundice. Purulent discharge from umbilicus. Trismus and risus sardonicus with complete inability to swallow fluids. Generalised reflex spasms of great severity with opisthotonus occurring every five minutes. These spasms lasted for periods up to two minutes and involved particularly the muscles of the chest, abdomen, and diaphragm so that respiration was completely stopped and cyanosis was extreme. It was clear that if these spasms were allowed to go on they must prove fatal in a few hours at most. They occurred without any apparent stimulus, but were brought on and made worse by manipulation.

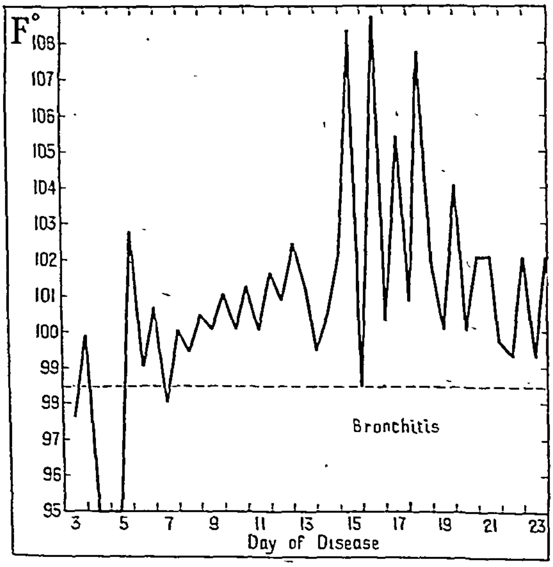

FIG. 1.—Reduced four-hourly temperature chart showing highest and lowest temperature recorded each day (rectal).

Treatment.—The child was anæsthetised with open ether and oxygen. 100,000 units (int.) were given intravenously through the anterior fontanelle and 0·3 c.cm. of avertin was given rectally. Subcutaneous saline, 80 c.cm., was also given. Later the umbilicus was cleaned with hydrogen peroxide, and hydrogen peroxide dressings applied. A stomach tube was passed nasally and left in situ, but some difficulty was experienced in feeding during the first twelve hours.

Progress.—Avertin was found to give complete relaxation and freedom from spasms for periods of from four to eight hours, according to the phase of the illness and the size of the dose. Up to the 9th day larger and more frequent doses of avertin were required, but from then onwards it was found possible to reduce the dose gradually. Immediately the spasms began to recur a further dose of avertin was given, the length of the period of freedom from spasms and the apparent severity with which they started to recur when the effects of the avertin began to wear off, being the criteria on which the next dose was estimated. In this way, for the rest of the illness except on a few occasions, severe spasms were prevented. The few which did occur were due to too long an interval between successive doses of avertin. After the 13th day the spasms were clearly less severe, and avertin was not given so frequently, but only when the spasms appeared to be coming on with particular severity. Avertin was finally stopped on the 25th day of the disease.

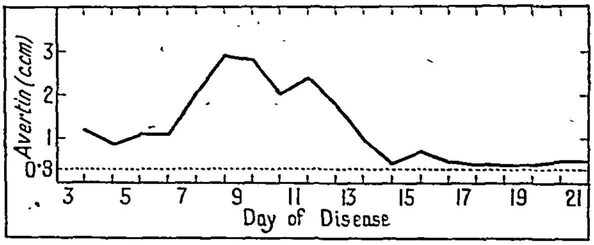

FIG. 2.—Chart showing daily dosage of avertin given.

After the 5th day cyanosis and shallow breathing became more and more marked after each dose of avertin. Warmed nasal oxygen relieved the cyanosis at once. From the 5th to the 20th day it was found necessary to give oxygen in this way for about six hours in every 24, and from the 8th to the 12th day it was given almost continuously. From the 15th to the 20th day there was considerable bronchitis and this probably made the cyanosis worse. Other complications were severe œdema of the scrotum from the 8th to the 12th day, and irritation and prolapse of the rectum on the 12th day, which rapidly cleared up when the dose of avertin was reduced. A slight erythematous rash appeared on the 9th day and gradually faded. This was probably due to the serum which had been given. A pressure sore on the hip was

Table showing Dosage of Avertin and Diet during the First Twenty-five Days of the Illness

Day of disease.	Amount of food in 24 hours.	Doses of avertin given.	Total amount of avertin given.
1st ..	..	..	..
2nd ..	..	..	..
3rd ..	Subcut. saline 80 c.cm.	0·3, 0·5, 0·4 c.cm.	1·2 c.cm
4th ..	Subcut. saline 210 c.cm. Milk (Trufood) 7½ oz.	0·4, 0·3, 0·2 c.cm.	0·9 ,,
5th ..	Milk 11½ oz.	0·3, 0·4, 0·4	1·1 ,,
6th ..	,, 12½ ,,	0·3, 0·4, 0·4	1·1 ,,
7th ..	,, 7 ,,	0·4, 0·4, 0·4, 0·4, 0·4	2·0 ,,
8th ..	,, 14 ,,	0·5, 0·4, 0·5, 0·5, 0·5, 0·5	2·9 ,,
9th ..	,, 12 ,,	0·5, 0·5, 0·4. 0·4, 0·5, 0·5	2·8 ,,
10th ..	,, 11 ,,	0·5, 0·5, 0·5, 0·5	2·0 ,,
11th ..	,, 12½ ,,	0·5, 0·5, 0·5, 0·5, 0·4	2·4 ,,
12th ..	,, 14½ ,,	0·4, 0·5, 0·5, 0·4	1·8 ,,
13th ..	,, 18 ,,	0·3, 0·3, 0·4	1·0 ,,
14th ..	,, 12 ,,	0·4	0·4 ,,
15th ..	,, 7 ,,	0·4, 0·3	0·7 ,,
16th ..	,, 15 ,,	0·3, 0·2	0·5 ,,
17th ..	,, 16 ,, Subcut. saline 90 c.cm.	0·2, 0·2	0·4 ,,
18th ..	Milk 18 oz.	0·2, 0·2	0·4 ,,
19th ..	,, 14 ,,	0·2, 0·2	0·4 ,,
20th ..	,, 15½ ,,	0·2, 0·3	0·5 ,,
21st ..	,, 13½ ,,	0·3, 0·2	0·5 ,,
22nd ..	,, 18 ,,	0·3	0·3 ,,
23rd ..	,, 15½ ,,	0·3, 0·2	0·5 ,,
24th ..	,, 17 ,,	0·2	0·2 ,,
25th ..	,, 16 ,,	0·2, 0·2	0·4 ,,
Theoretical caloric requirement per day 300 calories (given by 15 ounces of milk).		Total avertin	24·4 c.cm.
		Dose of avertin for basal anæsthesia 0·3 c.cm. (0·1 c.cm. per kg.)	

troublesome in the fourth week. Vomiting after feeds in the fourth week was immediately relieved by a stomach wash out.

After the 4th day, little difficulty was experienced with feeding. The feeds were given hourly, and the tube was removed once daily to be cleaned, but was immediately replaced. Extra subcutaneous saline was given on the 17th day, because the weather was intensely hot and the child seemed a little dehydrated.

The temperature chart (Fig. 1) shows the hyperpyrexia which occurred on three successive days and which is characteristic of severe tetanus. Details of the treatment with avertin and feeding are shown in the Table and Fig. 2. The reflex spasms grew gradually less after the avertin had been stopped and ceased on the 35th day. The tonic rigidity then grew gradually less and passed off about the 44th day. The general condition began to improve in the fourth week. On the 25th day the weight was 6 lb. 12 oz., and from then onwards the child gained steadily, being 7lb. 12 oz. on the 46th day, 8 lb. 7 oz. on the 57th day, and 9 lb. 3 oz. at ten weeks. The urine tested on the 30th day was found to be normal. At the age of two months the child appeared to be normal in every way and showed no sign of any mental abnormality or backwardness. The bowels were normal throughout the illness.

DISCUSSION

In the present case avertin produced complete control of the reflex spasms, relaxation of the jaw, and lessening of the tonic rigidity about ten minutes after it had been given. Such relief was maintained for from four to eight hours according to the dose given, and the phase of the disease. The only ill-effect which appeared to be directly due to the avertin was that on the respirations which became increasingly rapid and shallow about ten minutes after it had been given, and cyanosis came on within half an hour. The cyanosis was relieved by nasal oxygen, which had to be given more and more frequently and continuously as the illness progressed. The rectal irritation caused by the repeated doses cleared up quickly directly the doses were reduced in size and frequency. Apart from the above no ill-effects were noted.

It is interesting to note that the curve of dosage, which was determined solely by the period of freedom from spasms after each dose, showed a steady rise to a maximum on the 9th day, and then a steady fall showing that after the first symptoms appear it is many days before toxin produces its full effects, and that these only subside gradually.

The problem of giving sufficient fluid and food in tetanus is a difficult one on account of the combination of trismus and inability to swallow which is present in so many severe cases, and the fact that unless the reflex spasms are under complete control any attempt to feed brings them on. In the present case, the control of the spasms was so satisfactory that a stomach tube could be passed easily by the nasal route. By feeding at hourly intervals it was found possible to give the correct diet for the age and weight on most days. It should be noted that the child was unable to swallow any fluid until the 21st day of the disease. In a previous severe case in an adult, in which swallowing was impossible, I was able to pass a stomach tube under avertin so that the patient could be fed. In this patient the dose of avertin was not repeated for fear of giving an overdose and death took place during respiratory spasm.

How great is the danger of giving large and repeated doses of avertin is not yet known. Parsons [7] has shown that a dose of 0·475 g. per kg. produced fatty degeneration of the liver in a rabbit, so that the danger of toxic effects on the liver must not be overlooked. It is possible too that large and repeated doses given for many days may lead to dangerous cumulative effects. Some patients too may have an idiosyncrasy to the drug. Boyd [10] states that children stand avertin in ordinary doses particularly well. It is possible that very large doses in adults may be more dangerous and less effective. Such considerations emphasise the need for caution in giving large and repeated doses.

I have recently given 0·5 c.cm. per kg. in 27 hours to a five-year-old child with tetanus complicated by lobar pneumonia. Death took place 24 hours later, and histological examination of the heart muscle, liver, and kidney showed that they were normal.

Curare has been tried for the relief of spasms in tetanus,[6] and curarine has been used for the control of the spasms of experimental tetanus in rabbits[8] and has been suggested for human tetanus.[9] The results in this case suggest that avertin used in large doses may do all or more than has been hoped of curare or its derivatives, and that its use may be fraught with less risk.

In considering the result in this case, the exceptional severity of the infection should be remembered. The incubation period could not have been more than six and a half days and was very likely less. The period of onset was not longer than 30 hours, and was probably less. The respiratory spasm was so severe on the second day, that had they not been controlled the child must have died in a few hours at most. Hyperpyrexia occurred on three successive days, the reflex spasms lasted for 35 days, and the tonic rigidity for 44 days. In a series of 22 cases of tetanus which I have treated on the same lines as this case, but without avertin or with comparatively small doses, no case with a period of onset of 48 hours or less has survived longer than five days.

SUMMARY

A case of severe tetanus neonatorum with recovery is described. Treatment consisted of one large initial dose of intravenous antitoxin followed by continuous anæsthesia with avertin for 11 days and smaller doses for a further 12 days. Nasal oxygen was given continuously for long periods and a normal diet by stomach tube which was left in situ. A total of 19·2 c.cm. of avertin was given in the first 11 days, and 24·4 c.cm. altogether in 23 days. The weight of the child was 6–7 pounds.

It is suggested that treatment on the above lines with large and frequent doses of avertin will prove of great value in the treatment of severe cases of tetanus. The need for caution in giving such large doses is emphasised.

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INSTITUTE OF MEDICAL PSYCHOLOGY.—Dr. J. A. Hadfield, lecturer in mental hygiene at King's College, London, has been appointed director of studies at this institute (formerly the Tavistock-square Clinic). The increase of educational work carried out by the institute has made it necessary to create this post.

CLINICAL AND LABORATORY NOTES

TETANUS IN A CHILD AGED TWENTY-THREE MONTHS

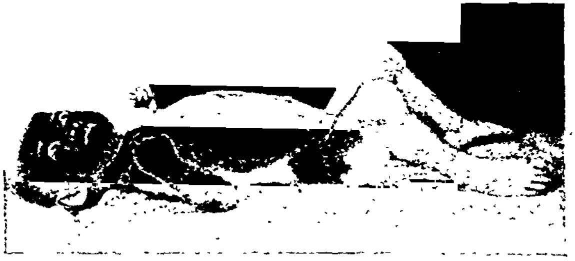
SUCCESSFULLY TREATED WITH ANTITETANIC SERUM

By J. D. Spillane, M.B., B.Sc. Wales
LATE RESIDENT MEDICAL OFFICER, LLANDOUGH HOSPITAL, PENARTH, GLAMORGAN

The following case is reported because tetanus in oung children is now fortunately rare, and because t illustrates the successful use of antitetanic serum n large doses, although the patient had been ill for hree weeks before treatment began. In all, 232,000 units of antitetanic serum were introduced, including 212,000 units intrathecally.

The child, aged 23 months, was admitted to Llandough Hospital on Dec. 21st, 1934. Three weeks previously, when in good health, he had begun to have difficulty in opening his mouth and taking food. Teething was thought to be the cause, but as the condition became more obvious in the next few days the family doctor was called in. He had great difficulty in opening the mouth, the jaws being held tightly clenched. No other abnormal sign was found. During a similar examination next day the patient went into a state of generalised tonic spasm with a prolapse of the rectum. Cyanosis was present and the breath was held, but no clonic spasms occurred. During the following fortnight the patient remained in a state of more or less generalised tonic spasm punctuated at intervals with exacerbations, during which the neck would be thrown back and a condition of opisthotonus produced. During such an attack sweating was profuse and urine voided. The attacks occurred two or three times daily.

On admission the patient was lying on his back with a frightened face and limbs fully flexed (see Figure). Colour and general build were good and consciousness fully retained. Handling was resisted and produced exacerbation of the spasm. The eyes were held practically closed and opening them was difficult. The pupils were normal and no strabismus was detected. The jaws could not be opened and the masseter, temporal, and platysma muscles were in a state of firm contraction. A thin-lipped grin with elevated chin and stiff neck produced a characteristic picture. The sternomastoid muscles stood out, the trunk was arched backwards, and the abdominal muscles board-like and visibly tense. The limbs were held rigidly flexed and could not be extended without using considerable force. The tendon-jerks of arms and legs were exaggerated and an extensor response was elicited on the right side. A marked feature was the retention of perfect consciousness, the patient following every movement with his eyes. No wound could be detected, healing or active, but in view of the rather long course of the disease, this could be readily explained.



Photograph of the patient, showing the mental alertness, the rigidly flexed limbs, and the slight opisthotonus

A diagnosis of tetanus was made, meningitis being excluded because of the mental alertness and the marked trismus. Lumbar puncture revealed a clear fluid under pressure: it contained no excess of cells and gave a negative *Nonne-Apelt reaction*; chlorides and sugar were normal.

Treatment.—On the day of admission (Dec. 21st) 40,000 units of antitetanic serum (A.T.S.) were introduced by cisternal puncture and 20,000 units intramuscularly. On the 22nd the condition was unchanged; breathing laboured and sweating marked. 40 c.cm. of cerebrospinal fluid (C.S.F.) removed by cisternal puncture and 40,000 units of A.T.S. introduced. Dec. 23rd: slight general improvement. 20 c.cm. of C.S.F. removed by cisternal puncture and 20,000 units of A.T.S. introduced. Dec. 24th: condition unchanged. 10 c.cm. of C.S.F. removed by lumbar puncture and 12,000 units of A.T.S. introduced. Dec. 25th and 26th: 10 c.cm. of C.S.F. removed by cisternal puncture and 40,000 units of A.T.S. introduced each day. By the 26th there was little improvement in the general rigidity, but exacerbations were becoming infrequent. Dec. 28th: 5 c.cm. of C.S.F. removed by cisternal puncture and 20,000 units of A.T.S. introduced. Jan. 2nd, 1935: general improvement. Trismus less, so that the infant opened its mouth sufficiently to allow the insertion of the little finger. Facial spasm less evident. Jan. 4th still some head retraction and arching of the back Limbs held flexed but less rigid.

During the following week improvement was rapid and the infant put on weight and improved in colour. By Jan. 15th he was apparently normal, the knee- and ankle-jerks were very brisk, however. One noticeable feature during convalescence was the high degree of intelligence he betrayed and the alertness with which he appreciated his surroundings.

The fact that this child had already survived three weeks' illness before admission to hospital meant that the prognosis was favourable before the commencement of serum treatment. It was noticeable, however, that the child's condition began to improve soon after serum was given; whereas he had been getting worse until he came to hospital.

My thanks are due to Dr. A. G. Watkins and Dr. D. G. Morgan for permission and help in publishing the notes of this case.

STONES IN THE HEPATIC DUCT

A REPORT OF TWO CASES

By Leonard Ley, M.B., B.Chir. Camb.
SURGEON TO THE GREAT YARMOUTH GENERAL HOSPITAL

The method of treatment suggested in this note, and adopted in Case 2, is based on what happened in Case 1.

Case 1.—Mr. A., aged 46, was under my care in 1924 for gall-stone colic and jaundice. He underwent operation on Aug. 7th, 1924, when the jaundice had cleared up. At operation I found the gall-bladder shrunken and attenuated and containing only a few tiny stones. I opened the bile duct and explored with my finger, but found no stones. The gall-bladder was removed and the bile duct drained; a large cigarette drain was also introduced.

Shortly after the operation I went for my holiday. On my return I was told the following story. My patient became very ill with pain, jaundice, and high temperature; and after several days the sister, who was dressing him, noticed some dressing protruding. This was removed and was followed by a copious gush of bile and a very large number of small stones.

The patient's general condition rapidly improved and he has remained perfectly well ever since. I assume that in withdrawing the drainage tube the gauze within remained adherent to the bile duct and that this blocked the duct and caused a damming-back of bile with dilatation of the ducts; when the pressure was released the flood washed out the stones.

This was a case where a surgical blunder cured what orthodox treatment would almost certainly have failed to relieve.

CASE 2.—Mrs. B., a stout woman aged 59, was admitted under my care on May 11th, 1933. Sent in by Dr. J. M. Smellie as a case of gall-stone colic. History of indigestion for two to three years, varying with attacks of severe pain. Last attack five months ago. Never had jaundice. At operation on May 22nd, the gall-bladder was found enlarged and thickened and contained stones. The common bile duct was much dilated and felt "mushy" with stones. The gall-bladder was removed and I then opened the bile duct and removed all the stones it contained with the finger in the duct aided by a scoop. When the main duct was emptied I could feel a stone presenting at the orifice of an accessory duct that I took to be the left hepatic duct. This was coaxed out by an angled probe and was promptly followed by another. In this way I removed six or seven stones and could feel no more, but naturally felt that it was more than likely that other stones were present. I decided to pack the common bile duct with ribbon gauze and so dam back the bile and trust the released flood of bile to wash out any stones left behind.

I first put a Spencer Wells forceps on each lip of the incision in the bile duct to act as scaffolding, I then tightly packed the upper end of the bile duct with ribbon gauze, and put a large corrugated rubber cigarette drain down to the bile duct. The wound was closed above and below the drain, leaving about 2 inches of the abdominal wall unsutured. The ribbon gauze and drain and the Spencer Wells were removed on the third day under gas anæsthesia and the duct was explored digitally—five stones were removed. I dressed the wound daily and explored it digitally for ten days, removing three more stones. No anæsthetic was required after the first dressing. She had only one hypodermic of morphia, gr. ¼, after the operation. She left hospital with the wound soundly healed on July 29th, 1933.

This second patient is now (in June 1935) perfectly well and has had no symptoms of any abdominal disease since her operation.

MEDICAL SOCIETIES

ASSOCIATION OF CLINICAL PATHOLOGISTS

THE summer meeting of this association was held in the pathological department of the Princess Alice Memorial Hospital, Eastbourne, on July 20th. Dr. A. G. SHERA, pathologist to the hospital, being in the chair. Dr. R. A. O'BRIEN (London) spoke on certain problems in connection with

Diphtheria Prophylactics

It was admitted, he said, that by the use of prophylactics it was possible greatly to reduce the incidence of diphtheria in a community; in Birmingham fever hospitals the introduction of prophylactic immunisation had reduced the incidence from 10 per cent. to almost nil. The problem now was to determine the most suitable prophylactic, and to ensure its intelligent use. There is, he said, no absolute line of demarcation between Schick-positive and Schick-negative individuals. Subjects whose blood showed 1/30th of a unit of antitoxin would give a negative Schick reaction; those possessing less than 1/1000th of a unit would give a positive reaction. The response to any given prophylactic depended to a large extent upon the existence of some potential antibody; those showing some degree of this basal immunity gave the best response to prophylactic immunisation. The response to any given prophylactic varied enormously in relation to this basal immunity; it was on the whole more difficult to produce a satisfactory response in children from sheltered homes than in those who had mixed widely with other children of all ages. On this account it was difficult to dogmatise as to the most effective method of diphtheria prophylaxis and result. Much still remained to be learnt as to the chemical constitution of alum toxoid. Different samples gave a nitrogen content of from 0·2 to 3·0 mg. per c.cm. The American requirement was that alum toxoid when injected into a guinea-pig in a dose of 1·0 c.cm. should produce two units of antitoxin in six weeks. He had tested a number of alum toxoids both American and English; few of these had reached the American requirement, but one sample made in London had, in certain guinea-pigs, produced five units. Mr. Glenny found that guinea-pigs gave a better response to two doses of 0·1 c.cm. at an interval of some days than to one of 1·0 c.cm. Answering questions put to him by practitioners, Dr. O'Brien said that the Schick-negative child cannot be regarded as absolutely safe against diphtheritic infection; a heavy dosage of a virulent organism may overcome the immunity, but the infection would almost invariably be clinically mild. The Moloney-negative reactor is virtually though not absolutely safe against unpleasant manifestations after immunisation; immunisation does not for practical purposes "sensitise" the subject. Dr. O'Brien pointed out that no matter what form of prophylactic has been used, the treated subject cannot be regarded as immune unless the immunity is demonstrated by a Schick test.

Prof. J. W. MCLEOD (Leeds) stated that in Leeds 19 cases of mild diphtheria had developed among over 30,000 children treated with diphtheria prophylactic. Nine of those children were known to be Schick-negative; the remaining 10 had not been tested.

BACTERIOLOGICAL DIAGNOSIS OF DIPHTHERIA.—Prof. MCLEOD spoke of the difficulties and a contribution made by new methods to their solution. He showed cultures of the gravis, intermediate and mitis strains of *C. diphtheriæ* growing on tellurite medium and demonstrated the differences in these strains, both cultural and morphological. On this medium 11 per cent. of positive throat swabs had shown *C. diphtheriæ* against 3 per cent. on ordinary Loeffler medium. There was a wide difference in virulence between the three strains. Of the gravis strains all were pathogenic to the guinea-pig, of the intermediate strains about 94 per cent. and of the mitis strains 86 per cent.

Whooping-cough

Dr. A. D. GARDNER (Oxford) said that although in domestic circles whooping-cough is still taken comparatively lightly, its mortality equals that of scarlet fever and diphtheria combined. For the prevention of epidemic spread it was essential for diagnosis to be made before the whoop developed. In this catarrhal stage bacteriological diagnosis alone was possible. After the second week the characteristic lymphocytosis developed and the complement-fixation test became positive, but it was then too late to prevent spread. Dr. Gardner described his method of isolation of the Bordet-Gengou organism by getting the patient to cough upon specially prepared serum plates. The proportion of positive cultures obtained in the first week was very high; after this it fell away; a positive culture was rare in the fourth week and it was doubtful if the subject remained infective to this stage. He was of the opinion that infection was always from case to case and that carriers do not occur. He was sceptical of the value of pertussis vaccine in treatment. In prophylaxis it was of value, but the organism used to prepare the vaccine must be freshly isolated and of a smooth strain; old rough cultures were of little use. Failure to produce satisfactory immunity in the past had been due to the use of old rough strains. Dosage must be large. He showed graphs illustrating the good results obtained by workers, particularly in the Scandinavian countries, by the use of large doses of a suitable vaccine in the prevention of epidemics.

In the discussion it was pointed out that pathologists working in small laboratories find it impossible to keep on hand a stock of the special medium necessary for the isolation of *B. pertussis*. In Denmark plates of suitable medium in metal Petri dishes are made available by the State Laboratory. Dr. Gardner hoped something of the sort could be done in this country.

Glandular Fever

Dr. L. E. H. Whitby (London) spoke of the infectivity of glandular fever. One patient had infected two attendants; in both cases the incubation period was one week. He had escaped infection himself, but he had, he thought, already suffered from the disorder, though it had been diagnosed as scarlet fever. After the incubation period there was fever lasting for about a week which might give rise to suspicion of enteric infection; glandular enlargement appeared in the second week and might be accompanied by considerable enlargement of the liver and spleen. The swelling affected the glands very irregularly; in some cases only the mediastinal or abdominal glands might be involved, when abdominal pain might suggest operation. The characteristic blood changes appeared in the pyrexial stage; the typical blood picture showed white cells 20–40,000 with 70 to 80 per cent. of mononuclears; these might be small lymphocytes or resemble monocytes. He demonstrated the Paul-Bunnell reaction which depends upon the fact that sufferers from this order develop within their serum heterophile antibodies against sheep red cells. The reaction becomes positive with the appearance of the glandular enlargement; how long it remains positive is not yet known. A titre of 1 in 100 may be regarded as diagnostic.

Dr. Weston Hurst (London) dealt with the clinical pathology of the virus diseases. The virus, he said, localises itself within the cell and therefore tissue reactions are not found. Such focal lesions as occurred were necrotic and marked by an absence of the cells usually associated with infective processes. For the demonstration of inclusion bodies he recommended routine fixation in Zenker's solution with acetic acid.

Dr. Shera described the mode of preparation of sensitised hæmolytic streptococcal vaccine and showed charts and case records from cases of hæmolytic streptococcal infection in which it had been used.

Dr. S. C. Dyke (Wolverhampton) described a case of aspirin poisoning.

REVIEWS AND NOTICES OF BOOKS

The Story of the Middlesex Hospital Medical School

By H. Campbell Thomson, M.D., F.R.C.P. London: John Murray. 1935. With 52 Illustrations. Pp. 182. 10*s.* 6*d.*

Rarely is an institution blest with so charming a writer to chronicle its story as is the Medical School of the Middlesex Hospital in the person of Dr. Campbell Thomson. Here is a living picture of the past depicted with the skill of an artist steeped in the traditions of his alma mater. "Where'er we tread 'tis haunted, holy ground"—no matter whether we are conducted over the Marylebone Fields in 1757, with perhaps a visit to the "Queen's Head and Artichokes," whether we listen with Charles Bell, newly arrived from Edinburgh, to the watchman calling "One o'clock and a starlight morning," or whether we "walk the hospital" with Charles Murchison in the 'sixties. All is unfolded with inimitable grace and sympathy. It will thrill the heart of every Middlesex man to move about in company with the men who founded his school, who fostered it with undaunted courage through many anxious years, and who, with ungrudging endeavour, have steered it to the honoured position it holds to-day. To a wider public it will make its appeal as an entrancing picture of medical life in London in the last hundred years. By a happy circumstance the centenary celebrations of the school have coincided with the completion of the rebuilding of the hospital, so the curtain falls on a great achievement.

Chapters are devoted to various epochs in the school's history, and each contains the names and deeds of those who played their part. One deals with the developments which finally led to the amalgamation of the school with the hospital, another with the War years, and yet another with contemporary events. At the time when various medical schools under the ægis of the University of London were establishing full time professorships in clinical subjects the Middlesex Hospital Medical School chose a different course. A number of appointments were created by which the pathological laboratories—and the school was fortunate in possessing a pathological institute through the generosity of Sir John Bland-Sutton—might be kept in close touch with the clinical side of the hospital. These were in the main full time appointments and included one or two junior members of the honorary staff, who were thus given an incentive to carry out scientific work at their own hospital instead of seeking other hospital appointments and paid posts elsewhere. This course of action, combined as it was with the endowment of professorships in non-clinical subjects, has proved of the greatest advantage to the school, not only in the reorganisation of teaching but in other respects.

We learn that the vexed question of the admission of women students first came under consideration in 1861. Miss Garrett (afterwards Mrs. Garrett Anderson) had taken the unprecedented step of endeavouring to obtain a medical qualification in Great Britain. She obtained permission to attend classes of the preliminary sciences in the medical school. Later, when she was allowed to visit the wards in company with the resident officers, the innovation created so strong a feeling among the students that a petition of protest was sent to the school committee. The lecturers, though apparently individually inclined to support Miss Garrett, collectively failed to face the storm, and a resolution was carried to the effect that "This meeting considers it very inexpedient that female students should follow the practice of the hospital and that the medical officers be earnestly requested not to permit any such persons to attend in the wards or out-patient room." An offer from Miss Garrett to endow a medical scholarship for women students at the Middlesex Hospital was declined.

The book is beautifully printed in large type and contains many excellent illustrations.

A Text-book on the Nursing and Diseases of Sick Children

For Nurses. Second edition. By Various Authors. Edited by ALAN MONCRIEFF, M.D., F.R.C.P. Lond., Physician to the Children's Department, Middlesex Hospital; Physician to Out-patients, the Hospital for Sick Children, Great Ormond-street. London: H. K. Lewis and Co., Ltd. 1935. Pp. 583. 15*s*.

NOTWITHSTANDING the limitation implied in the title of this book, we would bring it to the attention of medical students. The first part is devoted to a consideration of the general principles of medical and surgical nursing, with special reference to the technique and apparatus of the procedures described; separate chapters are devoted to anæsthesia, orthopædic surgery, fractures, shock, and so forth, and brief descriptions are given of a number of the commoner tumours, cysts, and deformities. The second part, which forms the major portion of the whole volume, constitutes an elementary text-book of children's diseases. It is not quite clear on what principle some surgical conditions have been included in the first part and some in the second, but apart from this minor peculiarity of arrangement, the book is well adapted for rapid reference. It is profusely illustrated with many excellent line drawings and photographs, and the general production maintains a high standard. A few inaccuracies that occurred in the first edition have now been corrected. The editor is to be congratulated on his success in welding the contributions of a number of authors into such a well-designed whole.

Diet Control

By GEORGE E. ANDERSON, M.D., Attending Physician to the Brooklyn Hospital and the Lutheran Hospital; and P. C. ESCHWEILER, M.D., Assistant Attending Physician to the Brooklyn Hospital and the Methodist Episcopal Hospital. New York: Gallo and Ackerman, Inc. 1935. Pp. 41, and many diet prescription forms. $3½.

THIS book is an interesting novelty consisting of a large number of diet prescription forms in a loose leaf binder arranged in such a manner that the practitioner can employ them for individual patients requiring diets for the treatment of such conditions as diabetes and obesity. Further supplies of the prescription forms can be obtained from the publishers when the originals are exhausted. An introductory brochure of 41 pages describes the principles to be applied in using the prescriptions. The system is that in use in the metabolic clinic at the Brooklyn Hospital, and contains well-arranged tables for the estimation of the calorie content of diets containing varying amounts of carbohydrate, protein, and fat.

The work is clearly one of those of interest to English readers merely as an indication of a method, because in actual practice the ingredients of the American menu differ fundamentally from our own; the British practitioner is unlikely to order kohl-rabi, rutabagas, or zuzu crackers in any quantity for his patients.

An Introduction to Gynæcology

Second edition. By C. JEFF MILLER, M.D., Professor of Gynæcology, Tulane University School of Medicine; Chief of the Department of Gynæcology of Touro Infirmary; Senior Visiting Surgeon, Charity Hospital, New Orleans. London: Henry Kimpton. 1934. Pp. 354. 25*s*.

DIRECTING attention to the dimensions of the scholarly and comprehensive treatises on gynæcology, which he provided for students and practitioners in America, Dr. Jeff Miller expresses his belief that they do not meet the need of the "beginning student." He offers this as an excuse for the publication of an Introduction to Gynæcology, and modestly states that in a book of this size the subject of necessity could only be presented in the barest outline. In this country such an explanation would prepare us for yet another of the pocket monographs; but, on the contrary, Dr. Miller does indeed introduce the subject in an admirable way. Pathology predominates, as it should, and a very nice balance has been maintained in the relative allocation of space to symptomatology, examination, and treatment. The paper, printing, and production are of the best; the same cannot be said of the illustrations, many of which, especially the photographs, have reproduced badly. The short bibliography appended to each chapter will be of value to students, and could be inserted with advantage in a greater number of text-books published in this country. If the "beginning student" masters this Introduction, he will assuredly have a sound foundation on which to build from his clinical experience.

British Journal of Surgery

THE July issue (vol. xxiii., No. 89) includes the following papers: Carcinoma of the Gall-Bladder, by C. F. W. Illingworth (Edinburgh). A clinical and pathological study based on knowledge of 50 cases. (See annotation on p. 261.)—The Operative Treatment of Fibrous Stricture of the Rectum: with the Description of a new Technique, by J. P. Lockhart-Mummery and O. V. Lloyd-Davies (London). The treatment of low annular stricture by internal proctotomy and repeated dilatation is briefly described. The new treatment for tunnel strictures consists of (*a*) clearing up the local sepsis; (*b*) in most cases, performance of preliminary colostomy; (*c*) operative approach to the rectum by excision of the coccyx; *longitudinal division of the stricture*; and closure of the incision transversely by two layers of sutures.—Notochordal Tumour of the Cauda Equina in a child of Eight Years, by V. H. Ellis (London). The tumour was pedunculated, entirely intrathecal, and histologically had the structure of a chordoma. Operative removal was successful.—Carcinoid Tumour of Meckel's Diverticulum: Report of a Case, by I. Price (London). The patient, a woman aged 54, developed acute peritonitis. She died after a resection of 13 cm. of small intestine, including the growth. The histology is discussed and literature briefly reviewed.—Incisional Hernia, by E. S. J. King (Melbourne). Escape of abdominal contents between peritoneal sutures, or through tears or hiatus along the line of peritoneal closure—and not stretching of the scar—is regarded as the underlying cause of incisional hernia.—Posterior Segmental Block-Excision of the Bladder Neck with Primary Closure, by S. Harry Harris (Sydney). An operation designed for the relief of obstruction such as may be caused by median bar formation, or disease of the posterior commissure, or general prostatic fibrosis; it consists of wedge excision of posterior lip of the urethra by the transvesical route.—A Case of Hyperinsulinism relieved by Partial Pancreatectomy, by J. Allan Berry (Napier, New Zealand). A clinical description is given of functional hypoglycæmia. The blood-sugar curves before and after removal of 28 g. pancreas are described and illustrated. The curious response to starvation and to glucose administration is discussed.—Congenital Dermoid Cysts and Sinuses of the Limbs, by M. J. Bennett-Jones (Liverpool). The anatomical localisation of these sinuses and cysts along the axial lines of the limbs is well illustrated by the five cases reported.—Acromegaly, by R. Lawford Knaggs (Newton Abbot). A historical survey is followed by a detailed description of the clinical features, and of the pathological nature of the skeletal changes. The pathogenesis, and the possibilities of treatment by irradiation, surgery, and glandular therapy are discussed.—Pseudo-Myelomatous Carcinomatosis, by L. Cosin (London). Full details are given of a case, with the typical features of splenomegaly, anæmia, with nucleated red cells and myelocytes, and the X ray picture of multiple myelomatosis. The primary lesion was bronchial.—Omental Torsion with Unusual Symptoms, by C. R. Salsbury (Kingston, Ontario). A description of two cases.—Strangulated Internal Hernia: Report of Cases of Strangulation in the Fossa Iliaco-Subfascialis and through the Foramen of Winslow, by G. F. Langley (Bristol). The second case was one of double obstruction—i.e., of the jejunum in the lesser sac, and of the pelvic colon by inflammatory fibrosis. The literature is reviewed.—The Value of the Urea-Clearance Test in Urinary Surgery, by E. W. Riches and J. Douglas Robertson (London). The technique of the test is described, and its reliability assessed in prostatic surgery, and in surgical diseases of the kidneys.—The Effect of Tracheal Occlusion on the Hypertrophy of Thyroid Transplants and Remnants, by E. Walter Workman and Gavin Miller (Montreal). Experiments were done on adult male and non-pregnant female guinea-pigs, stenosis being produced by partial ligature of the trachea. Hypertrophy followed partial extirpation of the gland. Partial tracheostenosis induced colloid states of the thyroid.—Cholecystography: its present Clinical Value, by Robert McWhirter (London). Includes an analysis of 4676 cholecystographic examinations at the Mayo Institute.—An Unusual Tumour of the Neck, by R. E. Norish (London). Histologically the tumour showed epithelium of an alveolar structure, lying in a mass of lymphoid tissue. The possibilities of origin from branchial tissue or from salivary remains are discussed.—Pathological Changes induced in the Mamma by Œstrogenic Compounds, by Harold Burrows (London). Hunterian lecture. The author regards the effect of œstrin as increasing the liability to cancer of the breast, rather than as directly causing it. Of 125 mice treated, 2 have developed cancer.—The Innervation and Muscular Activities of the Distal Colon: With a Note on the Surgical Treatment of Constipation, by Hugh C. Trumble (Melbourne). The indications are discussed for division of the lumbar sympathetic supply to the colon; of the lumbar sympathetic trunks; and of the hypogastric nerves.

NEW INVENTIONS

AN IMPROVED PNEUMOTHORAX NEEDLE

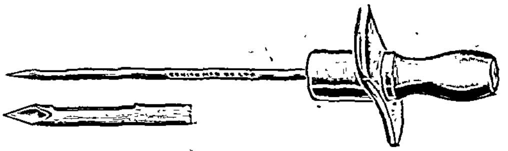
THE needle shown in the accompanying illustration was first manufactured to my specification by the Genito-Urinary Mfg. Co., some two and a half years ago. The needle combines the following advantages:—

(1) The solid end enables so sharp a point to be obtained that many patients find a local anæsthetic quite superfluous.

(2) The side opening in the form of a slit offers less resistance to penetration of the skin and allows the shaft of the needle to be of finer bore than in those models in which a circular opening is used. No stilette need be used, as blocking of the opening with blood or tissue from the chest wall (so common with end-opening needles), practically never occurs.

(3) The butt end of the needle fits directly on to a rubber tube, no tap being required. It will also fit a record syringe so that a sample of fluid can be withdrawn if desired.

This needle cannot be used for the induction of a pneumothorax or for the first two or three refills, since the side opening makes it necessary to push the needle one-eighth of an inch deeper into the pleural space than is the case with an end-opening needle. The risk of injury to the lung is diminished by the absence of blocking of the needle which is the commonest cause of too deep penetration.



I have had similar needles of wider bore made for *aspiration of fluid*. The side opening again has the advantage of not blocking nearly so frequently. The solid, sharp point permits forceless penetration of the chest wall even with a wide-bore needle.

No originality is claimed for any particular feature of this needle, which is only a slight modification of one previously designed (with circular side-opening) by Dr. F. G. Chandler. Acknowledgment is also due to Mr. R. Schranz of the G.U. Mfg. Co., to whose technical skill this needle owes most of its popularity.

ANDREW MORLAND, M.D., M.R.C.P. Lond.
London, W.

1. STOMACH-HOLDING FORCEPS

THE accompanying illustrations show the principles and action of forceps which I have designed and employed in suitable cases.

The first (*Fig. 1*) is a forceps primarily designed for seizing and holding the stomach in such operations as gastrectomy and gastro-enterostomy. It has been developed from the forceps that Pierre Duval designed for holding the lung, and the principal features of the instrument are: (1) while the blades are still triangular they are not fenestrated and the corners have been carefully rounded off; (2) the grip is obtained by means of a small raised piece of metal in which transverse longitudinal grooves are cut; (3) the blades are very light and springy and lightness and accuracy of pressure have been ensured by—(4) the long ratchet.

The second instrument (Fig. 2) is also designed for holding the stomach and intestines, and the figure gives an excellent idea of the tool. They are light and bowed and there is again the long ratchet;

ribbed rubber is threaded round the ringed gripping extremity. This instrument is excellent for holding the small intestine, but may be rather severe at times on the stomach. It is useful for holding the free edge of the liver—for example in local resection of that organ; and it can be used for holding a kidney or gall-bladder, but not all kidneys or gall-bladders are suitable for this type of grip.

FIG. 1

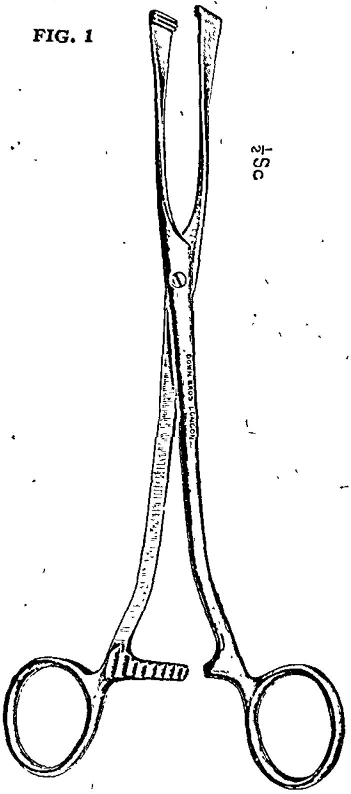
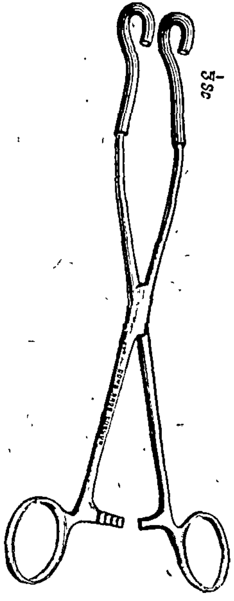


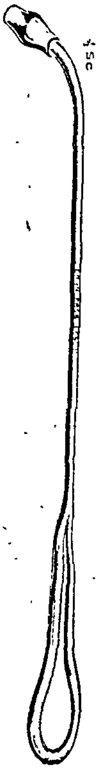
FIG. 2



2. A DRAIN INTRODUCER

This instrument is intended to facilitate the introduction of drains into the peritoneal cavity, and the illustrations (Figs. 3, 4, 5, and 6) give a good idea of the method of using it. I employ it largely in conditions such as perforation of duodenal or gastric ulcers where I am in the habit of making a mid-line supra-umbilical incision. The "introducer" is slipped into the lower angle of the wound and kept in intimate contact with the peritoneum along the middle line down to the level at which it is proposed to place the drain. The handle is then slightly depressed while the instrument, as a whole, is slightly raised. With the aid of this manœuvre the cup-shaped end of the instrument causes small areas of the suprapubic part of the abdominal wall to project. In fat individuals projection may not be visible, but can be readily felt. A small incision is made over the projection and with the point of the knife is deepened through all the layers of the abdominal wall right into the cup. Still holding the instrument firmly and steadily a curved artery forceps, about seven or eight inches in length, is pushed into the opening thus made into the cup. As the instrument is withdrawn the artery forceps is simultaneously pushed further in—its point remaining in the cup all the time. In this way the artery forceps ultimately reaches the lower angle of the wound. Its blades are opened sufficiently to seize a piece of split rubber drain about half an inch or thereabouts in diameter. The opening of the blades naturally widens the peritoneal and aponeurotic part of the incision. By withdrawing the artery forceps one end of the drainage tube is pulled through the small stab-hole, the other end is then placed to best advantage in the bottom of the pelvic cavity.

FIG. 3



The instruments have been made for me by Messrs. Down Bros.

T. J. D. LANE, M.D.

FIG. 4

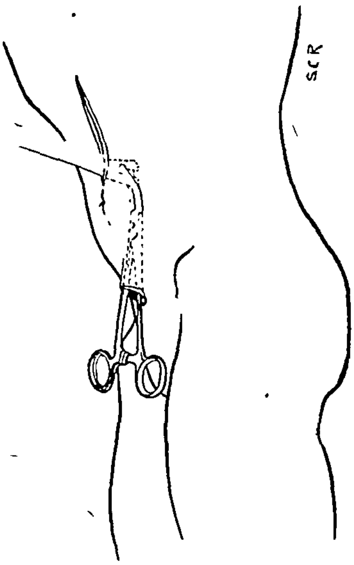


FIG. 5

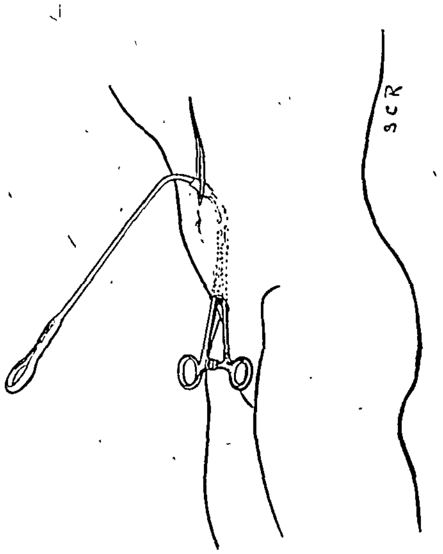
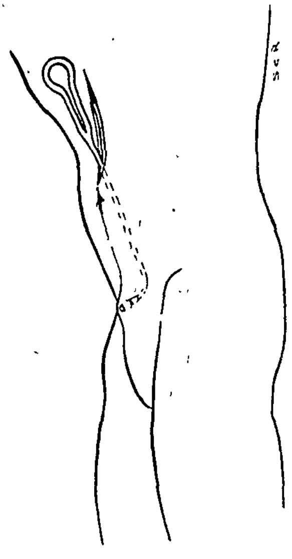


FIG. 6



THE LANCET

LONDON: SATURDAY, AUGUST 3, 1935

CONTRACT PRACTICE

HE extension of contract practice provided asion for an interesting debate during the ıual representative meeting of the British lical Association this year.[1] Three different isions had put forward motions asking for the ration of a resolution of the Representative dy dating back to 1920 so as to permit the ncil of the Association to sanction schemes for provision of medical attendance on a contract sis to persons whose incomes are above the tional Health Insurance Acts limit of £250 per num. One speaker recalled that the resolution question was originally passed in 1913, and he umerated some of the arguments which were ought forward at that time. It was said then t contract practice was not good for either tient or doctor, that it was derogatory to the ofession, and that any extension of such practice uld pave the way for the inclusion of the pendants of insured persons under the provisions the Insurance Acts. How remarkable has been change of opinion during the intervening cades is demonstrated by the fact that an endment to the three motions, expressing their mmon intention, was passed by a majority of 8 to 37, and the minority figure actually exag- rates the opposition to the extension of contract actice, since a number of the contrary votes were st against the principle of local option.

How are we to account for this changed attitude ? hat are the arguments which have induced most edical men to withdraw their opposition to ntract practice, and some of them, notably nong the younger ones, actually to press for its tension ? Probably the most effective argument s been the comparatively successful working of e Insurance Acts. There are nevertheless still any who, while participating in work under the cts, look on their compliance as "making the st of a bad job" and who feel—and sometimes y—that the profession in undertaking and couraging such practice is losing dignity and restige. If this were true it would undoubtedly rovide a strong case against contract practice ; ut nearly all the available evidence is to the ontrary. There is nowadays no significant oppo- ition among the insured population against the rovision for medical benefit, and the various ssociations of insurance committees have for a umber of years been pressing for the extension of edical benefit to dependants. The sons and laughters of comparatively well-to-do parents, hen they are in insurable employment, are ncreasingly prepared to accept medical benefit, and many movements are on foot among middle-class people to make provision by insurance on a contract basis for medical attention. No unbiased observer can fail to conclude that there is in our own as well as in other countries a growing belief in and demand for insurance provision of this kind. It is a usual assumption of those who see all good to lie in the past that the peoples of this island are a thriftless spoon-fed lot compared to their forefathers; but the mounting turnover of nearly all the insurance companies constantly disproves such assertions, for what is insurance but a modern and intelligent form of "putting something by for a rainy day" ? There is indeed ample evidence that the general public is gaining faith in contract practice and believes it to be good for the patient.

It remains to be considered whether it is also good for the doctor, and, most important of all, whether or not it is the system most likely to promote national health and well-being. The first need is to differentiate clearly between modern contract practice and the old-time club practice. Those who remember the evils of the latter and the stubborn and successful fight in our columns for its abolition may well dread any risk of a return to this pernicious system, and one can sympathise with their fears. The profession in this country has always condemned any system in which the doctor's position depends on political or any other than strictly medical considerations, and it is not likely to depart from this attitude. But there is a vast difference between being elected as a club doctor and being selected from a panel by an insured patient as his medical adviser, and we have no fear that any extension of contract practice on modern lines will diminish the prestige and independence of the family doctor. The most frequently urged objection to the contract system from the doctor's point of view is that it involves him in a lot of unnecessary and trivial work. It is probably true that the insured worker often comes to his doctor with complaints for which in the pre-insurance days he would have attempted to treat himself in order to avoid incurring a bill. As an offset to this, however, we have to reckon the probable effect of early consultation in serious illness in lessening the total amount of work that the doctor has to do for his practice. Theoretically at any rate the system puts a premium on health and not on illness, and the better the doctor does his job the less he has to do for his remuneration. In prolonged illness under a fee system, unless the patient is comfortably off, the conscientious doctor is placed in the awkward dilemma either of reducing his fees to the charity level at the risk of offending the dignity of his patient, or of reducing his visits at the risk of neglecting his job. This difficulty does not arise in contract practice. Financially the system, while precluding the amassing of large sums, has the advantages of security of income. At the average level of medical income in this country most people would consider that the advantages of security outweigh its disadvantages. It is no argument against the contract system to say, as is sometimes said, that its remuneration is inadequate. The remuneration obviously depends on the capitation rate which may be set at any figure agreed on after negotiation, and adequacy and fairness are at least as readily attainable in this as in any other system, since it operates on the law of averages.

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[1] See THE LANCET, July 27th, 1935, p. 208.

Finally we have to consider whether this system will aid in the achievement of a better standard of health among the people. Medicine, like industry, is suffering from the prevailing economic disability. There is not much wrong with the production of medical knowledge, but the distribution of it among the people of the country is far from satisfactory. It is probably not an exaggeration to say that if our present-day knowledge of nutrition, hygiene and preventive medicine generally were made readily available for all and effectively put into practice the resultant saving in sickness benefit alone would more than cover the outlay involved. The whole conception of the medical problem rests nowadays on a wider basis, and illness is coming to be regarded not so much as a morbid process but as a biological failure. It is being increasingly realised that prevention of that failure is at once simpler, less expensive and more effective in its results than the attempt to rectify it when it has occurred. The function of the medical man should in the future tend more and more to be that of the expert human biologist, giving advice to those in his care on how to achieve and maintain the fullest measure of health and vigour. Two things are clearly necessary if a development of this kind is to occur. First the doctor must be in the relation of trusted family adviser to his patient, and secondly he must be readily available and in a position to offer his advice whenever he thinks it necessary and not only when called in to attend a sick patient. It may well be that the ultimate solution of the proper adjustment of his relation will be found to lie in the more general adoption of the contract system. At any rate local option as to its development can hardly do harm.

THE TREATMENT OF TETANUS

IN general practice tetanus is a rarity, but it is one of those rarities which lies on the conscience of the general practitioner, for it is amenable, at least in some degree, to treatment, and to that end diagnosis must be prompt and proper management must be instituted immediately. If the chance of meeting with the disease in this country is small it is nevertheless widespread, since tetanus spores are abundant in the soil of the inhabited areas, and quite common in the fæces of farm animals. No doubt they often gain entry to wounds and abrasions, but fortunately they do not produce the tetanus toxin unless they are allowed to germinate and then grow for a day or two; and being anærobes, they can do this only in the absence of oxygen—that is, only when the wound is deep or is scabbed over, and when other organisms or foreign bodies have so damaged the tissues as to hinder their permeation by oxygen from the capillaries. Hence tetanus is rare, but since the conditions favouring it are always likely to occur from time to time, in small wounds as in large, the disease is not likely to disappear. The toxin once produced spreads freely, undamaged by oxygen, and is taken up by the lymph and into the blood. Thence it enters the nervous system through the peripheral endings of the motor nerves all over the body. It travels up their axons into the central nervous system and there produces the spasms and convulsions of the disease by poisoning the anterior horn cells and the corresponding cells in the brain stem; "lockjaw" is early, and therefore ominous, because the journey up the fifth nerve is short, and the first stiffening, in the jaw muscles, is quickly noticed by the patient.

Specific treatment with antitoxic serum has been as disappointing in tetanus as it is successful in diphtheria. The reason is that the antitoxin can neutralise the toxin only in the blood stream; it cannot follow the toxin into the nervous system through the multiple wicket-gates of the motor end-plates, and it cannot reach the nerve cells themselves by any other route. Even FILDES and FLOREY's ingenious attempt[1] to suck it in osmotically from the cerebro-spinal fluid, by giving serum intrathecally and hypertonic saline intravenously, met with failure. By the time tetanus is clinically recognisable much of the toxin must already be in the nervous system, but still more may be coming into the blood from the organisms in the wound, and therefore antitoxin is worth giving. Dr. LESLIE COLE[2] who has treated 21 cases of tetanus in Cambridge advises injection of 200,000 units, intravenously. This is enough and the injections need not be continued, for observations on 4 of his patients have shown that after this dose the blood retains enough antitoxin for the next fourteen days to neutralise any toxin that may reach it. The toxin already in the nervous system, however, continues its evil work.

The fact that some patients recover shows that the body can eventually destroy this toxin, if it does not succumb to the secondary effects of the poisoning. These are chiefly exhaustion (and sometimes asphyxia) from the muscular spasms, inanition from the inability to take food, and hyperpyrexia. If these effects can be countered by symptomatic treatment, the patient may be kept alive until he can recover. Curare, with its classical action of blocking the impulse in the motor nerve just as it reaches the muscle, has been suggested as a suitable means of abolishing the spasms. COLE[2 3] tried it in three cases and found that it greatly diminished both the spasmodic tetanic contractions and the tonic rigidity between them, even in doses which were not large enough to abolish respiratory movements. That was encouraging, and were the curare action as simple as it at first appears it might be possible to push it further to produce complete paralysis, substituting mechanical artificial respiration for spontaneous respiration. Curare, however, is a mixed and variable product; it may contain poisonous ingredients as yet undefined, and there is a suggestion that its rigidity-reducing action in tetanus is a new and central action, not the peripheral one familiar to the physiologists. Prof. Florey[4] has therefore treated experimental tetanus in rabbits with the alkaloid curarine, which has the classical action only. It controlled the rigidity and the fits by producing its characteristic paralysis, and the animals had sometimes to be put in a modified Drinker's respirator. He suggested the use of a similar procedure in man. Dr. Cole, however, has in most of his cases used Avertin anæsthesia for the same purpose. It is simpler and much more familiar, and to judge from the case he reports in our present issue it is also effective. In discussing his 21 cases he points out that the well-known relation between prognosis and length of incubation period is remarkably precise: excluding patients over sixty, those with an incubation period of 7 days or more recovered, while those with an incubation period of less than 7 days died. By this criterion, the infant showing the disease at 6½ days of age should have died: but kept continuously under the influence of avertin for three weeks, and fed through a stomach tube, it recovered. It may be hoped that, unless adults are a great deal more intolerant of avertin than children are, this substance will do as much in the treatment of tetanus as curare was expected to do, and with less risk and uncertainty. That may help to save some of the severe cases, with short incubation periods, and should make the problem of feeding easy. The hyperpyrexia remains to be both explained and treated. It has been suggested that the tetanus toxin may reach and disturb the heat-regulating centre; if so, it may do likewise with the respiratory and vasomotor centres. So cold sponging or cold baths may be called for; a Drinker's apparatus or a Bragg-Paul pulsator should be available; and the pulse and blood pressure must, of course, be watched. It is not surprising therefore that Florey pled for the rapid transport of cases of tetanus to pre-arranged centres, where teams of people with equipment and experience are ready to deal with them. With the general practitioner would remain the important responsibility of recognising the disease at once, of knowing how much can be expected or hoped from modern treatment, and of getting his patient in the least possible time to a place where that treatment is available.

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[1] Fildes, P., and Florey, H. W.: Brit. Jour. Exp. Path., 1927, viii., 393.

[2] Cole, L. B., and Spooner, E. T. C.: Quart. Jour. Med., July, 1935, p. 295.

[3] Cole, L. B.: THE LANCET, 1934, ii., 475.

ACCIDENT PRONENESS

The modern tendency to think in terms of establishing and maintaining health, rather than of patching and repairing the inroads of disease, is nowhere better exemplified than in the activities of the Industrial Health Research Board—one of the few good things born of the war, by munition workers out of welfare. The fifteenth annual report[5] tells of many researches completed and in progress. The establishment of standards of physique for different grades of the community is an example; university students were found to be 2 inches taller than employed workers, 3½ lb. heavier, with greater muscular power; while unemployed men were 1 inch shorter than the employed, 7 lb. lighter, with much less muscular power. Mental and physical activity are closely associated, as also, nearly certainly, is physical health, although no reliable health data could be collected. London men excelled in height and weight, which fell away in passing north through Birmingham and Liverpool, by Leeds and Sheffield to Glasgow. Sedentary work seemed to recruit small men, and the heavy industries those of superior physique; but mechanisation may be expected to annul the demand for brawn and muscle. Nevertheless, creative effort is essential, if the best is to be got out of any man. Strength was found to decline with the approach of middle age; but no evidence was forthcoming about age variations in mental activity.

A result of studying industrial records, of great topical interest, has been the discovery of "accident proneness," an innate characteristic of some persons. This proneness obeys definite laws; it is found in one-quarter of the people, and results in this minority accounting for three-quarters of all accidents. Its laws hold good for accidents in the home and on the road, as well as in the factory—even for the chances of getting a foreign body in the eye. It is a personal phenomenon, independent of conscious action or blameworthiness. The accident prone are generally the least healthy and the world's worst workers; in industrial life they can be detected, and, by removing them from risk, the incidence of accidents may be greatly reduced. On the road, they are the hardened, bad drivers, and their elimination from those licensed to drive would reduce to 25 every 100 accidents that are occurring daily. Another important law relating to accidents is their liability to happen to the inexperienced: thus, in one instance,[6] an accident rate of 111 per 1000 workers of under six months of service fell away to only 8·5 for those of 10 to 15 years of service. Clearly avoidance of a high labour turnover conduces to a low accident-rate. There is known to be an optimum temperature, 67·5 F. at which fewest accidents occur, and exact information is now being sought as to the effect of lighting on the incidence of accidents. Indeed, accidents would appear to be as possible of control as other interferences with health. Study is being devoted to the influence of noise upon sickness absenteeism; it may increase the incidence of "nervous" cases. Pronounced individual differences have been revealed in psychological make-up; to some the unbroken uniformity of repetitive operations is a source of dissatisfaction; others experience no boredom and are content. But healthy and cheerful surroundings go far to minimise boredom and discontent; so also do such distractions as gramophone music, although the time and type of music must be suitable. Interest also attaches to a research into perseveration, of which an instance is afforded by the driver who continues to put his foot on the accelerator instead of the brake, because in his last car the brake was in the position of his present accelerator. These are only a few of many answers being sought to problems of everyday practical importance. As each answer emerges the rule is confirmed that it is not so much prosperity which gives health as that health brings prosperity.

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[4] Florey, H. W., Harding, H. E., and Fildes, P.: Ibid., 1934, ii., 1036.

[5] London: H.M. Stationery Office. 9d.

[6] Factory Accidents. Shaw Lectures. Royal Society of Arts, 1935.

ANNOTATIONS

PAVLOV

THE Neurological Congress brings many distinguished visitors to London, and among them we are glad once more to welcome Prof. Ivan Pavlov, now in his eighty-seventh year. Unknown outside Russia until the first decade of this century, his name has now become part of the vocabulary of physiology, inseparably linked with classical experiments on the digestive tract and the nervous system. To him we owe our knowledge of the mechanisms by which the digestive juices are secreted and adjusted in quantity and quality to the type of work they may be called upon to perform, and from him we have received the first glimmerings of the light which purely objective methods may throw upon the workings of the cerebral cortex. We could only detract from his work by attempting to give an account of it here; few are unacquainted with its broad outlines, and full translations of Pavlov's own published records are readily available. We may, however, attempt to understand the spirit in which it was done, and the principles on which it was based. Indeed, it is not difficult to summarise these in a single word, well known, well understood, often extolled, but seldom applied: "thoroughness."

His observations depended on the careful making of fistulæ at the time when asepsis was less commonly a feature of physiological experiments than it is to-day. He achieved success by adopting the most stringent surgical precautions before and during the operation, and by the care he bestowed upon his animals afterwards. This minute attention to detail characterised not only the execution of his experiments, but also their design. His operations were planned so that organs were made to yield accurate information under circumstances which differed as little as possible from the normal, and which allowed a transference of results, with little reservation, to the intact animal. The maintenance of nerve and blood-supply to the isolated gastric pouch is a case in point; Pavlov realised that unless this was in all respects a replica of the main organ, the operation was not worth performing. He would rather risk failure than abandon the ideal of perfection, and although few can hope to share his endowment of manual skill, we should sacrifice nothing of value if all were to adopt his methods of investigation. These are seen at their best in his work on conditioned reflexes, in which the success of each experiment depended on a rigid control of the animal's surroundings, even to the way in which it was approached by the experimenter. In these researches we discern not only elaborate care in design and execution, but the perfection of a new experimental method—a method whose conception signifies genius, and whose accomplishment bespeaks the self-confidence of one who has previously overcome apparently insurmountable difficulties. It is not easy to predict what its results will be, but it provides one of the few systematic means of access to that elusive entity, the mind.

But Pavlov's work—indeed, his whole life—means more than the addition of a few fresh facts to our store of knowledge. It is a corroboration of the faith of every scientist that forethought, tenacity of purpose and continued vigilance cannot fail to wrest from nature at least a few of her most closely-guarded secrets. In particular, it is an inspiration to the biologist, who is so often faced with a seemingly uncontrollable environment for his experiments.

INFANT FEEDING AND MORBIDITY

THAT the artificial feeding of infants has greatly improved in recent years—with increased knowledge of accessory food factors and the introduction of dried milk products with their superior keeping qualities—is not likely to be disputed. To what extent, however, artificial feeding can replace breast-feeding without detriment, not in a relatively few isolated cases but quite widely, is quite another matter. For an answer to that problem it is essential to have the evidence of growth curves and of sickness and mortality experiences. To the latter indices attention has been recently devoted by Grulee, Sanford, and Herron[1] and Grulee, Sanford, and Schwartz,[2] whose observations are drawn from 20,000 infants under the care of the Infant Welfare Society for Chicago for as long as nine months during the years 1924–29 inclusive. Nearly 10,000 of these infants were entirely breast-fed (with accessory feedings —e.g., orange juice, cod-liver oil); over 8,000 were partially breast-fed (comprising those who were entirely breast-fed for a time and then had to be weaned and those whose breast-feeding was complemented); and 1707 were artificially fed from the first.

The illnesses experienced in each group were recorded over the first nine months of life and classified in three broad categories, respiratory, gastro-intestinal, and other infections. From these data morbidity rates have been worked out for each separate month of age. The breast-fed were found to have sickness rates from respiratory infections mainly below those of the partially breast-fed. On the other hand, for the first four months of life the artificially fed have still lower rates, lower than those of either of the other groups, but they rise, somewhat abruptly, to a considerable excess in the 6th to 9th months of life. As might be expected, the breast-fed suffer substantially less than either of the other two groups from gastro-intestinal infections, but again the artificially fed show a relatively low incidence at 0–4 months and a considerable excess at 6–9 months. The same kind of feature is shown by the unclassified infections —viz., a lower incidence amongst the breast-fed, little to choose between the other two groups until the 6th month of life is reached. The general trend of these figures is an increasing incidence of sickness up to about the 6th month, followed by a declining rate in the totally and partially breast-fed, but a continued rise in the artificially fed. On the whole breast-fed have a clear advantage, especially in their relative freedom from gastro-intestinal disturbances, but the differences between the other two groups are not at all clear cut. It is difficult to see why the artificially fed should show to advantage in the first few months and be at a disadvantage in the later.

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[1] Jour. Amer. Med. Assoc., 1934, ciii., 735.
[2] Ibid., 1935, civ., 1986.

The authors suggest that some immunity, declining with age, may be inherited from the mother and that breast milk may prolong this immunity beyond the sixth month; but this hypothesis cannot account for the lower rates amongst the artificially fed in the first 4 months of life. The comparison of the groups on the basis of their feeding presumes, of course, that they are broadly equivalent in other respects —e.g., their general environmental conditions. The authors do not provide any direct evidence on this point, though they show that their population is drawn from many different nationalities; only 10 per cent. are American.

It certainly seems impossible that the sickness experience can be representative of all infants, for the mortality is incredibly low. Amongst the 20,000 infants observed for nine months (or till death if earlier) there were but 227 deaths which gives a rate of only 11 per 1000. Sixty per cent. of these deaths were recorded in the small group of artificially fed infants, but in view of the extraordinarily low total rate it is difficult to accept this excess mortality as a characteristic of the feeding. Each group may be unrepresentative of the total experience from which it is drawn and perhaps not equally unrepresentative.

THE ACCURACY OF THE MEDICAL DIRECTORY

THAT admirable book of reference, Churchill's Medical Directory, should be accurate as a matter of service to the medical profession, and accuracy can only be ensured by regular communication to the Editor of the Directory, of changes of address. On page (272) of the current issue of THE LANCET will be found an alphabetical list of members of the medical profession concerning whose present address information is sought. We join with the Editor in hoping that the information will be promptly forthcoming.

Not only those individuals to whom application is made, but to the whole medical profession one word of warning is necessary. The maintaining of the accuracy of the Medical Directory in no way acquits a member of the medical profession from keeping the Registrar of the General Medical Council informed of any change in his residence. From time to time an official inquiry is sent to his registered address, and if this is unanswered his name appears in an official list of uncommunicated addresses published at definite intervals in our own columns. Failing reply to either of these his name is erased from the Medical Register under Section 14 of the Medical Act, 1858, and he loses all the privileges of registration under that Act. No reply to the Editor of the Medical Directory relieves a member of the medical profession from the responsibility of immediate response to any inquiry from the General Medical Council. The Medical Directory is an unofficial list of first value for reference to the medical profession, but the Medical Register is the official list, and it must be made plain that a member who finds his name in the list issued by Churchill is not absolved from replying to the General Medical Council.

POST-OPERATIVE CIRCULATORY LESIONS

AN attempt to throw light on post-operative circulatory lesions by radiography has been made by J. Frimann-Dahl.[1] First of all diaphragmatic movements were studied radiologically after abdominal operations in 20 cases. This investigation showed that the excursion of the diaphragm is generally much diminished, especially when the incision has been made in the upper part of the abdominal wall; but that normal movement returns in from one to twelve days. The next step was to study the rate of the venous circulation, which was estimated by means of intravenous pyelography, following the injection of Per-abrodil into the saphenous vein. Bed rest, except in thyreotoxic cases, was found to cause a definite retardation in the flow of blood. After operations, especially those frequently followed by thrombosis, the venous blood stream was mostly found to be very slow. Sometimes the blood coming from the saphenous vein flowed in a retrograde direction down the femoral vein, indicating almost complete stasis. In one such case the femoral vein was so dilated that it appeared to be under considerable tension and thrombosis was evidently imminent. Considering the causation of post-operative venous stasis Frimann-Dahl suggests that the chief factors are post-operative meteorism and muscular inactivity. The retardation of the venous circulation tends to last throughout the period of bed rest and cannot therefore be due primarily to diaphragmatic paralysis, since this is much more transitory and is often seen to be diminishing while the venous stasis is increasing. The flow of blood in the lower extremities may be accelerated by raising the foot of the bed, by massage, by active movements of the leg muscles, and by the inhalation of carbon dioxide; any of these methods may therefore be useful in the prophylaxis of venous thrombosis. The minute study of 14 patients with post-operative pulmonary embolism was also undertaken. Small emboli studied in serial radiograms were found only to produce transitory changes; those of larger size produced definite infarcts of triangular or circular outline usually situated at the base of the lung. Pleural effusion was frequently seen and adhesions obliterating the costo-phrenic angle proved to be a common sequel.

ALCOHOL AND ROAD ACCIDENTS

Mr. Hore-Belisha, Minister of Transport, asked the British Medical Association at the beginning of the year to give him its observations on the place of alcohol in the causes of road accidents. The Association appointed a special committee under Dr. W. G. Willoughby, and its report has just appeared.[1] The committee concentrated on small or "subintoxicant" doses of alcohol, less than would be likely to bring a motorist into the dock and far less than would cause social drunkenness. It has perforce relied on indirect evidence: statistics of accidents in which the question has been raised of whether the driver was under the influence of drink, and experiments on the effect of alcohol upon the faculties—judgment, memory, reaction, and muscular coördination—which are the foundation of safe driving. It quotes the Alcohol Committee of the Medical Research Council for the statement that alcohol is a narcotic and impairs judgment, concentration, self-criticism, and the power of estimating risk. It therefore leads persons to take risks and make rapid decisions less judiciously than they otherwise would. Impairment of concentration and reasoning power has, the committee point out, been established by physiological experiment. The driving of a motor car involves a succession of highly skilled muscular movements which depend on rapid and accurate coördination between the hands, eyes and feet. According to the M.R.C., the speed with which

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[1] Post-operative Röntgenuntersuchungen. I. Diaphragmabewegungen und der post-operative venenstrom. II. Post-operative Lungenembolien. By J. Frimann-Dahl. Acta chirurgica, Scandinavica. National trykkeriet. Oslo. 1935. Vol. lxxvi. Sup. xxxvi. Pp. 168.

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[1] Brit. Med. Jour., July 27th, 1935, Supplement, p. 57.

the gaze is directed to fresh objects is diminished by alcohol. Speed and accuracy of hand movement have been shown by typewriting tests to suffer, and the coördination required in rifle-shooting and mountaineering is impaired. Alcohol disappears slowly from the blood, and substantial amounts remain in the blood even several hours after a moderate quantity of drink has been taken. The committee conclude that three ounces of whisky will affect the driving capacity of many persons some hours afterwards, and will make them think they are driving better than usual while really they are less efficient. These findings are no surprise to persons with any training in physiology, but may be news to laymen and lawyers. Besides indicating a possibly fertile cause of accidents, they suggest that the present law is not being administered as the facts demand. Under the Road Traffic Act a motorist is culpable who is incapable through drink or drugs of having proper control of his vehicle. This provision will cover the motorist who is not nearly drunk in the social or police-court sense, but its application is a matter of opinion. The subject was threshed out fairly fully at the Medico-Legal Society last month[2] when discussion indicated that before a motorist is likely to be convicted he must show some fairly obvious symptoms. Many physiological authorities regard him as a dangerous motorist even when he is apparently sober, simply because a minimal quantity of alcohol will impair his judgment of speed and distance, his visual acumen and his reaction-time, the factors which the National Institute of Industrial Psychology regard as essential in a driver's safety or danger. It is not likely that police surgeons and courts will give the Act the drastic interpretation which the facts suggest, because incapacity must be proved as a fact, and individuals differ so much in their initial skill and their reaction to alcohol. Better results should be obtained by energetic publication to motorists and pedestrians of the danger of little drinks.

A POISONED KIDNEY

A QUANTITATIVE study of renal injury due to acute poisoning by bichloride of mercury is recorded by Freyberg and Lashmet.[3] The patient, a woman aged 20, took 1·5 g. of the poison, and though much of it was vomited, enough was retained to cause severe gastro-enteritis for several days. Within a few hours of ingestion there was much albumin, with large numbers of renal epithelial cells and renal tubule casts in the urine, and in 7½ hours the urea clearance was down to 34 per cent. of the normal. The clearance diminished to 10 per cent. between the second and ninth days, and thereafter improved slowly but steadily, reaching the normal again 3½ months after the mercuric chloride was consumed. Impairment of the capacity of the kidney to form urine of high specific gravity and of the capacity to excrete phenolsulphonephthalein was demonstrated, and it is interesting to note that the quantity of albumin, casts, and renal epithelial cells passed in the urine diminished considerably before there was any great improvement either clinically or in the capacity of the kidneys to excrete, or to form high concentrations of, the natural constituents of the urine. The treatment of the renal lesion consisted in the daily administration of 5000 c.cm. of fluid intravenously either as physiological saline or as 5 per cent. glucose. Thus stimulated, the kidneys excreted the water and evidently the non-protein nitrogen with it, for the non-protein nitrogen of the blood was but slightly increased. Moreover, no ill-effects were observed which could be ascribed to the intravenous administration of fluid, there being for example no œdema. It should be remembered however that in acute nephritis not due to metallic poisons, large volumes of fluid usually fail to increase the urine flow and are retained in the tissues. Thus the treatment which has met with success in a case of mercurial poisoning may prove dangerous if applied to other renal lesions.

Porter and Simons[4] have described the therapeutic effects of gastric lavage, alkalis and intravenous administration of 1000 c.cm. of saline 12-hourly so long as vomiting persists. Of 46 cases of mercurial poisoning so treated 43 recovered. The plasma non-protein nitrogen was over 50 mg. per 100 c.cm. in the three fatal cases and under 50 mg. in all those that recovered.

C S M M G

The new Register (1935) of the Chartered Society of Massage and Medical Gymnastics contains the names of over 9,500 members, of whom more than 600 are masseurs. When this society came into existence as a chartered body in 1920, as the result of the fusion of the Society of Trained Masseuses and the Institute of Massage and Remedial Gymnastics, its total membership was 3,640. The great and continuing growth of the society in the last fifteen years has been due to the increasing recognition of the value of physical therapy as an ancillary to medical and surgical treatment, when under proper control, and it sufficiently refutes the occasionally heard assertion that this branch of therapeutics has been losing its usefulness since the war years. These registered members have passed through a comprehensive and practical two years' course of education in massage and medical gymnastics, including training in hospitals, and have been accredited by searching examinations. Most of them hold additional qualifications in medical diathermy and light therapy, which entitle them automatically to admission to the Society of Apothecaries' Register of Biophysical Assistants. Certificates are granted also after training and examination in medical electricity, light and electrotherapy, medical hydrology, and for teachers of massage and medical gymnastics, medical electricity, and medical hydrology. The Register of the Chartered Society indicates these various distinctions in each case. It is supplied free of charge to medical practitioners anywhere on application, thus providing them with the names and addresses of members practising in all districts. All these members have pledged themselves not to undertake any case except under the direction of a registered medical practitioner, not to advertise except in recognised medical and nursing papers, and not to sell goods to patients in a professional capacity nor to accept secret commissions on the sale of goods. A high standard of professional honour has thus been attained, and the sweeping away of the evil practices of last century has gained for the Chartered Society the confidence of the medical profession and the general public. There has thus been made available for medical practitioners a service of highly trained and trustworthy assistants in physical therapy, and it is a reasonable hope that they will be employed in preference to other exponents of this therapy who have not accepted such a course of training, nor bound themselves not to compete with the medical profession. The evils of uninstructed and uncontrolled physical therapy can only be overcome if members of the Chartered Society receive the full support of medical practitioners; they depend for their livelihood on such coöperation which they have set themselves to merit. The annual congress this year of the Chartered Society is to be held in Harrogate from Sept. 18th to 21st, and its scientific meetings are open freely to medical practitioners on presentation of their visiting cards. Among the subjects to be discussed are: the treatment of hips and spines at American orthopædic clinics; functional disorders and malingering; fibrositis; short-wave therapy; bone regeneration; and the spa treatment of rheumatism. All these topics will be introduced by medical experts.

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[2] THE LANCET, July 6th, 1935, p. 31.

[3] Freyberg, R. H., and Lashmet, F. H.: Amer. Jour. Med. Sci., March, 1935, p. 392.

[4] Porter, W. B., and Simons, C. E.: Ibid., 1934, clxxxviii, 375.

CATARACT FOLLOWING THE USE OF DINITROPHENOL

ANYONE who has followed recent medical writing on the subject must be aware that opinion on the place of dinitrophenol and allied compounds in the treatment of obesity is sharply divided. Some of the arguments were stated briefly in these columns about a year ago.[1] It was admitted that certain of the nitrophenols are powerful stimulants of katabolism and are therefore bound to be effective in reducing flesh. At the same time, it was pointed out that unpleasant symptoms and even death had followed the indiscriminate use of these drugs, and readers were reminded that the physician commands no means of lowering a basal metabolic-rate which has been raised too far. There is still no general agreement whether the undesirable symptoms encountered are specific toxic effects of the drug, or simply expressions of excessively high metabolism, although it is not easy to attribute some of the recorded symptoms to the latter. Meanwhile two papers from San Francisco[2] provide a strong argument in favour of giving up the use of these drugs for the present. They record six instances of cataract occurring during the treatment of obesity with dinitrophenol; the patients were women in a period of life when spontaneous cataracts are rare; the ages in five being 50, 36, 39, 40, and 30; the cataracts were bilateral and rapidly progressive, becoming measurably worse in periods measured by days and leading in more than one instance to almost complete blindness within a month. Two of the patients had received the drug under strict medical supervision, a third had treated herself, and in the remainder no particulars are given. The authors of the papers urge that "further use of dinitrophenol should be discontinued, pending further study on its secondary systemic effects." It is possible, though very unlikely, that the cataract in these cases was due to some factor other than the treatment. A less improbable explanation is that the particular preparation of dinitrophenol was contaminated with some unknown toxic substance. But with the eyesight of a patient at stake, however slight the risk, the duty of the physician is clear.

Our previous article concluded with the following question: "Is it justifiable, in dealing with a condition which almost always responds readily to a little wholesome discipline (i.e., dietetic restriction), to employ instead a drug of unquestioned potency but uncertain toxicity?" The tragic accidents now described should resolve any lingering doubts about the answer.

AIR RAID PRECAUTIONS

THE first of a series of handbooks on Air Raid Precautions has just been issued by the Home Office. It is entitled No. 2—"Anti-gas Precautions and First Aid for Air Raid Casualties." (H.M. Stationery Office, 6*d*.) The general preface to the series of handbooks emphasises that their production is a measure of precaution only, and does not arise from any belief that war is imminent. This particular handbook has been written for those who would be engaged on first-aid services for the civil population, and especially members of the St. John Ambulance Brigade, the St. Andrew's Ambulance Association and the British Red Cross Society. It deals with the gases and other chemical agents which might be employed in war, and indicates the probable methods of their use. No suggestion is made that there are new gases of exceptional potency. Two types of respirator are described: the general service respirator as issued to the Navy, Army and Air Force, and a simplified pattern designed mainly for persons employed in civil air raid services. The last chapter sets out the organisation of a combined first-aid and decontamination centre for members of the public. In addition to these handbooks the Home Office promises a series of memoranda dealing with the organisation of public air raid precautions by local authorities.

MALIGNANT DISEASE OF THE GALL-BLADDER

Is the possibility of future malignant change a good reason for persuading a patient with gall-stones to consent to operation? Dr. John F. Erdman,[1] reviewing his experience of 525 gall-bladder operations, concludes that it is not. His argument is that, considered statistically, the patient's chance of dying as a direct result of his operation is higher than his chance of subsequently developing cancer in the gall-bladder. Among his 525 cases there were 15 deaths—a mortality of 2·8 per cent.—but only 6 (1·1 per cent.) with malignant change. Erdman would have us, therefore, lay stress rather on the likelihood of chronic ill-health or of repeated colic than on the possibility of cancer. C. F. W. Illingworth,[2] on the other hand, maintains that the danger of cancer developing is quite appreciable, and that, for the prevention of future malignancy, the benefits of excision of the gall-bladder in all cases of calculus cholecystitis far outweigh the risk. The figures he quotes for the incidence of carcinoma following gall-stones—viz., 7–8 per cent. in 500–600 cases (Riedel), and 81 carcinomas in 592 autopsies on patients with gall-stones (Fawcett and Rippelman)—are very considerably higher. In all 5 of Erdman's cases in which operation revealed carcinoma of the gall-bladder, a stone or stones or biliary sand was also present; and in the single case of sarcoma there were five stones. (Sarcoma is, of course, a very remote possibility; he found only 30 cases on record.) Of Illingworth's 50 cases of malignant disease 31 definitely had gall-stones; in 7 they were undoubtedly absent; in 12 there was no record of presence or absence.

Illingworth is convinced that carcinoma of the gall-bladder is preceded in every case by cholecystitis. The patient will therefore tend to give a typical gall-bladder history, with "flatulent indigestion, pain below the costal margin, and occasional attacks of biliary colic." Nausea he found to be a constant symptom. The diagnosis of malignancy is very unlikely to be made until the abdomen is opened, since only the presence of metastases can give definite pre-operative evidence. Erdman says that jaundice does not develop unless the liver is already invaded. All his cancer patients had the typical pain, in the usual site and with typical radiation, and they later developed digestive disturbances. In one case, operated on for a perforation of the gall-bladder, a suspicion of malignancy at the time of operation was not confirmed by the pathologist's report, but in 7½ months secondary deposits had caused a recurrence of pain and jaundice, and nothing could be done. In the solitary case of sarcoma a definite lump was palpable in the right hypochondrium. Cholecystectomy was performed with ease; the wall of the gall-bladder was 1½ in. thick, and there were present in it several large nodulated masses of a livid to purplish hue. While Erdman thinks that papillomata may be a precursor of cancer, Illingworth holds that they bear no important relationship to one another. In the cholecystogram papillomata show up as patches of decreased density; one such case is illustrated in Erdman's paper. He is strongly in favour of cholecystectomy as the operation of choice in diseases of the gall-bladder. The danger of missing a carcinoma or papilloma in the simple drainage operation is one of his main reasons for this opinion. In his own series, cholecystectomy was performed 522 times, and cholecystostomy 3 times.

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[1] THE LANCET, 1934, i., 746.

[2] Boardman, W. W.: Jour. Amer. Med. Assoc., July 13th, 1935, p. 108; Horner, W. D., Jones, R. B., and Boardman, W. W.: Ibid.

[1] Ann. of Surg., May, 1935, p. 1139.

[2] Brit. Jour. Surg., July, 1935, p. 4.

Illingworth recognises four pathological types of carcinoma of the gall-bladder—the scirrhous carcinoma, which is the common type, the papillary, the mucoid, and epithelioma (very rare). This last type—an example of a squamous-cell growth occurring in a columnar-cell epithelium derived from ectoderm—is to be regarded as arising by a process of metaplasia, the columnar-cells reverting to primitive form and subsequently assuming squamous characters.

The Duke of Kent has appointed Dr. A. E. Gow, physician to St. Bartholomew's Hospital, to be physician in ordinary to his household.

Sir George Chrystal, secretary to the Ministry of Pensions, has been appointed permanent secretary to the Ministry of Health, in succession to Sir Arthur Robinson. After fifteen years at the Health Ministry Sir Arthur has accepted the chairmanship of the Supply Board, newly reconstituted with a view to the needs of the Defence Services.

INDEX TO "THE LANCET," VOL. I., 1935.

THE Index and Title-page of Vol. I., 1935, which was completed with the issue of June 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Aldephi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.—Princess Louise, Duchess of Argyll, recently laid the foundation stone of the nurses' home at this hospital of which she is president. The estimated cost of the new building is £30,000, and £12,000 has already been subscribed. The site has been provided by an anonymous friend who contributed £2000 for the purpose.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. M. Brown and A. H. Harkins to *Victory* for R.N.B.; and G. D. Macintosh to *Vernon*.

Surg. Lt.-Comdrs. F. B. Quinn to *Victory* for R.N.B.; and M. Barton to *Drake* for R.N.B.; C. R. Boland to *Pembroke* for R.N.B., temp., and to Woolwich (on commg.); J. J. Cusack, M.B., to *Victory* for R.N.B., temp., and to Faulknor; and T. F. Crean, to *Drake* for R.N.B.; F. C. M. Bamford and W. A. Hopkins to *President* for course; C. Keating to *Drake* for R.N. Hospl., Plymouth; G. Rorison to *Victory* for R.N.B.; and W. G. C. Fitzpatrick to *Pembroke* for R.N.B., and to *President* for course.

Surg. Lt.-Comdr. (D) D. Barker to *Woolwich*.

Surg. Lts. S. K. Foster to *Pembroke* for R.N. Hospl., Chatham; and J. A. Page to *Drake* for R.N.B.

Surg. Lts. (D) A. W. Y. Price and F. A. Pearse to rank of Surg. Lt.-Comdr. (D).

Act. Surg.-Lts. R. S. Jenkins, L.D.S., and W. J. Wolton, L.D.S., to be Surg.-Lts. (D).

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdrs. R. L. Stubbs to *Victory* for R.N. Hospl., Haslar; and E. E. Henderson to *Furious*.

Surg. Lt. T. H. Pierce to *Renown*.

ARMY MEDICAL SERVICES

Col. T. S. Dudding, O.B.E., late R.A.M.C., having attained the age for retirement, is placed on ret. pay.

Lt.-Col. G. F. Rudkin, D.S.O., from R.A.M.C., to be Col.

ROYAL ARMY MEDICAL CORPS.

Majs. to be Lt.-Cols.: W. P. Croker and E. W. Wade, D.S.O.

Capt. R. A. Bennett to be Maj. Jan. 29th, 1935. (*Substituted for notification in the Gazette of Feb. 8th, 1935*, vide THE LANCET, Feb. 16th, 1935, p. 398.)

REGULAR ARMY RESERVE OF OFFICERS

Maj. Sir Robert G. Archibald, C.M.G., D.S.O., M.D., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

ARMY DENTAL CORPS

Lt.-Col. W. M. Ferguson, having attained the age for retirement, is placed on ret. pay.

Maj. G. F. Charles to be Lt.-Col.

Maj. (prov.) A. H. Kay reverts to the rank of Capt.

TERRITORIAL ARMY

J. J. M. Brown (late Cadet, Edinburgh Academy Contgt., Jun. Div.), O.T.C., to be Lt.

Lt. A. C. Armstrong to be Capt.

G. Carruth (late Offr. Cadet, Queen's Univ., Belfast, Contgt. (Med. Unit), Sen. Div., O.T.C.), to be Lt.

ROYAL AIR FORCE

MEDICAL OFFICERS AS PILOTS

An amendment to the King's Regulations and Air Council Instructions provides that a medical officer who has qualified as a pilot may, when facilities exist at the unit to which he is posted and provided he is medically fit, keep himself in flying practice. Unless, however, he has flown solo during the preceding three months and has had *solo* flying experience in the type of aircraft which it is proposed to fly, the C.O. will ensure that he receives adequate dual instruction in that type before he flies solo.

Wing. Comdr. R. W. Ryan to Central Medical Establishment for duty as President of the Central Medical Board.

Dental Branch.—H. M. G. Williams, L.D.S., is granted a non-permanent commission as a Flying Officer.

RESERVE OF AIR FORCE OFFICERS

Flight Lt. P. J. Nyhan relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE

Capts. to be Majs. (provl.).—Bt. Maj. M. S. Gupta, S. P. Joshi, R. Linton, and H. W. Mulligan.

The Commander-in-Chief in India has made the following appointments:—

Lieut.-Col. P. S. Tomlinson, D.S.O., as D.A.D. of Medical Services for Mobilisation, Northern Command.

Lieut.-Col. G. F. Allison, M.C., as D.A.D.M.S., Northern command.

Major-General J. F. Martin, C.B., C.M.G., C.B.E., is granted two months' leave from August 7th, when he will vacate his officiating appointment as Director of Medical Services in India. At the expiry of his leave he will vacate his substantive appointment of D.D.M.S., Western Command.

Dr. A. H. L. Thomas has been appointed Admiralty surgeon and agent for London district No. 15 (Westminster, Victoria, &c.).

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXIII.—PROGNOSIS OF HALLUX VALGUS AND HALLUX RIGIDUS

Hallux Valgus

UNCOMPLICATED hallux valgus is a painless static condition like genu valgum, and may be present for many years without symptoms. It is the bursitis which so often supervenes that causes pain, and when inflammation or even suppuration are added, the condition becomes extremely disabling. Over-riding toes may also cause pain by producing troublesome corns and callosities. We must therefore be cautious of advising operative treatment in the absence of pain unless, as sometimes happens in young women, it is desired purely with the object of improving the appearance of the feet. Palliative treatment is, on the whole, ineffective and the proprietary bunion pads are of little use. In an early or mild case it is sometimes worth while trying faradism to the short muscles of the foot and a plaster-of-Paris splint to be worn at night, but the mechanics of the condition demand a shortening of the bony pier on the inner side of the foot and any treatment that fails to achieve this is rarely successful. If operation is advised it should be restricted to such toes as cause pain, and an infected bursitis must first be cleaned up, even though this may necessitate a preliminary ten days in bed. It probably matters very little whether the head of the metatarsal or base of the first phalanx is excised so long as enough bone is removed to allow of full correction. The toe is held in position for ten days after operation by some form of semi-rigid bandage, and at the end of that time the patient may begin to walk. It will usually be three weeks from the operation before an ordinary shoe can be worn, and progress is naturally quicker in unilateral than bilateral examples.

There is a great tendency for patients to try to spare the inner border of the foot by walking on its outer edge, and this is the commonest cause of failure after operation. Every patient should be told he *must* bear weight on the inner border of the foot lest he gives himself a secondary metatarsalgia. A. Blundell Bankart has advised an *outside* wedge of ¼ in. after operation, and this should be a standard post-operative precaution.

Patients vary in the duration of convalescence, which occasionally is very slow. This is often because they are not made to realise the necessity of early weight-bearing on the operated toe, and are allowed to hobble around for months on the outer borders of their feet, courting secondary metatarsalgia and usually getting it. A determined or understanding patient will recover very rapidly, and I recall a girl of 19 who was in the semi-final of a tennis tournament less than four months after a bilateral operation, and an out-patient sister who returned to her exacting duties three weeks after a similar operation.

Operation for hallux valgus has an undeservedly bad reputation, and results are much better than is often believed. The two fundamental secrets of success are (1) to remove enough bone, and (2) to get the patient to bear weight early on the operated toe.

Hallux Rigidus

Hallux rigidus is an entirely different condition. It is not a static deformity but a degenerative osteo-arthritis. It occasionally follows an injury, but is much more often like (hallux valgus) a manifestation of the flattening foot which (in straight-toed individuals) induces an osteo-arthritis by the repeated trauma of phalanx and metatarsal being crushed against one another. The earliest manifestations are restricted dorsiflexion and the development of dorsal osteophytes. Dorsiflexion of the big toe takes place every time we lift our heel to take a step forward, and this becomes painful or impossible. Palliative treatment consists in trying to eliminate this movement of the toe by the insertion of a steel plate in the sole of the shoe. It removes the natural spring from walking, and is rarely a conspicuous success. Splints worn inside the shoe are more efficient but less comfortable, and operation is frequently demanded for the relief of pain. Osteo-arthritis elsewhere is often best treated by arthrodesis, but the mechanics of walking make this procedure unsuited to the metatarso-phalangeal joint. It is therefore proper to excise the head of the first metatarsal with its peripheral osteophytes, and to leave the base of the first phalanx alone.

In contradistinction to hallux valgus, the big toe is sometimes stiff after operation, but there is usually a great relief in spite of this, and a patient is generally able to resume activities and even games which were previously impossible.

ERIC I. LLOYD, M.B., F.R.C.S.,
Orthopædic Surgeon to the Royal Northern Hospital, and Surgeon to the Hospital for Sick Children, Great Ormond-street.

TOXICITY OF INDUSTRIAL SOLVENTS.—At the request of the Home Office, the Medical Research Council have undertaken to promote investigation into the question whether various volatile substances might injure the health of workers using them under industrial conditions. To assist and advise them in this matter, the Council have appointed the following special committee. Sir Joseph Barcroft, F.R.S. (chairman); Dr. J. C. Bridge; Prof. A. J. Clark, M.D., F.R.S.; Mr. A. G. Green, F.R.S.; Prof. J. A. Gunn, M.D.; Prof. E. H. Kettle, M.D.; Dr. H. B. Morgan; Mr. J. Davidson Pratt; Mr. D. R. Wilson, C.V.O., C.B.E.; and Sir David Munro, F.R.C.S.Edin. (Secretary).

SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION

PROCEEDINGS OF THE REPRESENTATIVE BODY

(*Concluded from p. 212*)

The Services

In proposing the adoption of the remainder of the Council's report under "Naval and Military," Dr. F. W. **Goodbody** accepted a request by Torquay (Dr. E. **Ward**) asking the Council to consider the adequate representation of the Home Defence Forces on the Committee. He said that the Admiralty appeared to be applying satisfactorily the terms of service recommended in the Warren-Fisher report and that the Naval Medical Service was worthy of support by the Association. Conditions in the R.A.F. Medical Service seemed to be much the same; owing to expansion, civilian doctors were being employed, and their conditions would have to be watched very carefully. The Directors-General of the two senior services were made Rear-Admiral and Lieutenant-General respectively, on appointment, but the Director-General of the R.A.F. Medical Service had not yet been made an Air Vice-Marshal.

Rear-Admiral A. R. **Thomas** said that the Admiralty had faithfully tried to apply the recommendations of the Warren-Fisher Committee, and substantial benefits had been obtained. Plenty of applications, of high standard, were being received, and he had no hesitation whatever in advising a man to join this service. The new regulations should be given a chance.

Dr. **Goodbody** moved a motion expressing satisfaction with the R.A.M.C., saying that valuable concessions had been secured from the Army Council and criticism should be withheld at the present time. An officer could now retire after five years' good experience with a fairly substantial grant; further, on medical matters, the medical officer was to be allowed access to the Army Council, and the Director-General could go straight to the Secretary of State. There was a great shortage of R.A.M.C. Territorial officers, concluded Dr. Goodbody, and he hoped that representatives would help to remedy this. After strong reasoned support from Col. J. W. H. **Conway**, Col. C. H. H. **Harold**, and Dr. G. F. **Gibbons**, the meeting passed the motion. The **Chairman** congratulated the Committee on a brilliant piece of work. The report under "Indian Medical Services" was also approved, on the motion of Sir **Richard Needham**, who explained how this service had been reconstituted.

Hospitals

Dr. **Peter Macdonald** moved the adoption of the Annual Report on Hospitals, and also—

> That para. 5 of the Summary of Conclusions and Recommendations of the Association's Report on the Problem of the Out-patient be amended by the addition of the following :—All patients presenting themselves at hospital for treatment without a doctor's letter should be examined by a registered medical practitioner on the Staff of the hospital. Such cases will fall into two categories : (1) Emergency cases ; (2) Non-emergency cases, and should be dealt with as follows : *Emergency cases* should receive appropriate first treatment, and if no special hospital treatment is required, be referred back to their own doctors. The term "own doctor" means the doctor from whom the patient would ordinarily obtain domiciliary treatment. *Non-emergencies*, unless they require special treatment which can be obtained only at hospital, should be referred back to their own doctor without receiving advice or treatment."

[Para. 5 of the Conclusions and Recommendations at present reads : "Further checks and safeguards should be established at all voluntary hospitals before treatment is undertaken at the out-patient department."]

Southampton, however, wished to delete :—

> "*Non-emergencies*, unless they require special treatment which can be obtained only at hospital, should be referred back to their own doctor without receiving advice or treatment," and to substitute :—"*Non-emergencies*, except the necessitous poor, shall be referred back to their own doctor."

In the absence of its representative and on the vigorous opposition of Dr. **Macdonald**, the meeting rejected Southampton's amendment, which, said Dr. Macdonald, would only irritate all concerned and was a retrograde step in the Hospitals' Policy, which considered that there was no need to differentiate the necessitous poor. Dr. **Stratford** proposed the omission of the words "unless they require special treatment which can be obtained only at hospital"; for who, he asked, was to decide what that was and to estimate the abilities of any given general practitioner ?—Dr. H. D. **Woodroffe** (Oxford) added that there was no hurry about these patients, who could wait for proper reference by their doctor and who should be discouraged from dropping into hospitals for special treatments.—Dr. **Wand** (Birmingham) said that the words "obtained only at hospital" accurately defined "special treatment," and thought it important to find a form which hospitals would accept.—Dr. E. R. C. **Walker** and Dr. F. **Gray** supported the amendment, proffering their experience in Aberdeen and at the Bolingbroke Hospital, Wandsworth.—Dr. **Macdonald** failed to persuade the meeting that there was nothing much in the amendment after all, though he pleaded for the countryman who came a long journey from a district where no specialist treatment was available.

As the result was 65 votes to 50 in favour of the amendment, there was no two-thirds majority as required to alter the policy of the Association. The amendment was put as a substantive motion, with this warning, and the necessary majority was then obtained.

Dr. **Macdonald** then brought forward a motion reiterating that consultants should use the second page of the Association's model hospital letter in writing to doctors whose patients had come without a letter.—Birmingham objected again, as it had last year, and Dr. **Wand** moved :—

> "That the recommendation be amended by the deletion of the words 'second page of the form when returning the patient to his own doctor,' and the substitution therefor of the following :—
>
> '..................Hospital.
> ....Date.
>
> Dear Dr..................
> I have to-day seen your patient..................and am of the opinion that he, or she, is suffering from..................
> I have therefore (1) admitted him/her.
> (2) Ordered the special appropriate treatment.
> (3) Given emergency treatment.
> (4) Referred him/her back to you.
> Yours faithfully,
> ....'
>
> "That the Association take steps to make available to hospitals a supply of the form referred to in the foregoing Motion."

He could not see, he said, what confusion could be caused by the use of two forms. The use of the form proposed would educate young house-surgeons in the B.M.A. policy.—Dr. J. A. BROWN was amazed that this resolution should have had to be brought up again after being passed by a large majority last year. The second page of the model form was practically a blank sheet and not in any way comparable with the form proposed.—Dr. A. MACCARTHY pointed out that the form Birmingham wanted to use was for cases where the patient brought no letter with him and so the consultant had no "second page" to use.—Dr. MACDONALD thought Birmingham's form an excellent one, but the other was already in wide use. Mr. McADAM ECCLES regarded it as disastrous to try to upset the quarter of a million forms already in circulation, and said Birmingham could have its own form if it liked. Birmingham gained support from Dr. GRAY (Wandsworth) and Dr. KEITH GIBSON (Kensington). The London Panel Committee, said Dr. GIBSON, and the London Public Medical Service had gone to the trouble of printing their own forms, as they felt they needed more than the B.M.A. form. They convinced a large majority of the representatives, and the amendment was carried.

Dr. HOWIE WOOD (Isle of Wight) proposed, and agreed to refer to Council :—

"That the Representative Body is of opinion that when members of the honorary staff of a voluntary hospital receive payment for services rendered to a public authority, or receive monies in the form of a staff fund in connexion with their work under a contributory scheme, their status as members of the honorary staff of the hospital should not be affected; and that the Council be instructed to consider what, if any, amendments to the Hospital Policy of the Association are necessary in order to give effect to the foregoing."

The Supplementary Report under "Hospitals" brought a long statement from Dr. MACDONALD, as it dealt with provident schemes for middle-class persons. Last year, the Council was asked to arrange for a payment to the general practitioner to be included in these schemes, and it regretfully reported itself unable to do so. Schemes for specialist services seemed to rest on a much more secure actuarial basis than could be provided for general practitioner attendance, and it would prove almost impossible to define a "general practitioner condition." There were, said Dr. Macdonald, no data on the costs of "g.p." treatment. The Association was going to call a conference to consider the establishment of a permanent central body to coördinate the activities of local provident associations; the subject could then be raised once more.

Manchester wished to refer the matter back to Council, because some general practitioners were already being paid.—Dr. R. BOYD said that if the scheme were limited to specialists the principle of free choice of doctor must be infringed. Several bodies in Manchester and other towns had paid general practitioners for years. He did not wish, he concluded, to go back to his division and say that the B.M.A. had again let down the general practitioner. —Mr. McADAM ECCLES thought the day had not yet come, though he hoped it soon would; meanwhile investigation must go on—there was great need for grants-in-aid towards serious illnesses demanding specialist services.—Dr. WATERFIELD asked Dr. Boyd to withdrawn this motion, as the matter had been thoroughly studied and the Council had done all it could do at present.—Dr. KEITH GIBSON could not follow the extent to which cases and their doctors might go to hospital under provident schemes.—To which Dr. MACDONALD replied that the answer could only be given by an individual provident scheme. Reference back to Council, he added, could only have the same result again; the Representative Body must either approve the report or withdraw its approval of last year. Manchester's motion was, however, carried by a small majority (45–39).

Medical Benevolence

Dr. E. E. BRIERLY presented the Council's report under this heading, pointing out that a number of children in Scotland were being educated at day schools in addition to the 56 Foundation Scholars maintained at Epsom. There had been an increase in subscriptions of over £700, apart from a windfall of £925, the residue of the late "Dr. Cooke Appeal Fund." The year before the establishment of the Charities Fund and Committee the sum of £1616 had been subscribed for medical benevolence; this had increased to over £7000, but was still quite insufficient. —Dr. LEWIS GLOVER (Hampstead) said the panel committees were coming along splendidly.

Miscellaneous Motions

Dr. WATERFIELD proposed three motions for Kingston :—

"That it is the opinion of the Representative Body that instruction in anti-chemical warfare measures, should be given to medical students.

"That similar instruction should be available for post-graduates.

"That in view of the necessity for educating the public in measures of protection against chemical warfare, the B.M.A. should ask for the coöperation of its members."

The CHAIRMAN said that he and Dr. Anderson had recently been invited to a conference on these matters at the Ministry of Health, which was fully alive to the problem and to the value of the Association's organisation for disseminating knowledge.—Dr. F. C. GITTINGS invited any member to go to Portsmouth for a week's anti-gas course free, and Dr. N. WEST-WATSON described the campaign of the St. John Ambulance Brigade and British Red Cross. Dr. E. CASSON emphasised the danger of alarming the general public and recommended the example of the Dutch medical profession's "war prophylaxis committee." Kingston's motions were carried.—Dr. A. T. JONES (Brecknock) proposed that the Council should consider means of opposing and preventing all chemical warfare. To get rid of war, said Dr. H. CAIGER (Sheffield), was the duty of this generation, just as the nineteenth century had got rid of slavery. The meeting cordially agreed.

Sheffield found the working of the Workmen's Compensation Act very unsatisfactory as regards miners' nystagmus, and Dr. CAIGER gave a full statement of the problem, emphasising the anxiety neurosis involved, the high incidence in miners over 50, the small amount of disablement, and the difficulty of distinguishing those disabled from those not disabled. The first result of the Act, he said, had been injustice to the employers, and their reaction had brought hardship to the men. The medical profession could solve this difficult problem by insisting on better lighting in the pits, the provision of suitable work for patients and more accurate certification. It had been shown that miners with slight nystagmus could go on working with better light and be cured. Mr. BISHOP HARMAN supported the resolution, which was carried, asking the Council to initiate action on the matter.

Dr. B. H. Pain, for Tunbridge Wells, urged the importance of getting medical men on the boards of local authorities and asked the Council to consider the establishment of a fund to help medical candidates at local elections. His eloquent appeal was supported by Dr. W. Asten, who nevertheless said that Bournemouth objected to the fund, and asked the Council instead to consider the wisest procedure to ascertain the candidates most fitted. The amendment was feelingly seconded by Dr. W. G. Willoughby (Eastbourne), who had seen many medical members on local authorities. He thought a fund would greatly reduce the doctor's chance of election, as the candidate must represent a district and not a special interest. Dr. A. B. Murray also urged that medical men should come forward on their own merits and not as sectional representatives. Support on these lines came further from Dr. H. Robinson (Kensington), Dr. Middleton Martin, and Sir Henry Brackenbury. This weight of argument drowned the faint appeals made for the impecunious candidate, and Tunbridge Wells withdrew their motion in favour of the amendment brought forward by Bournemouth.

Torquay (Dr. Ward) proposed :—

> That in view of the fact that certain non-nationals are being admitted to the Medical Register after only an abbreviated course of study in the British Isles, and are coming into competition with our own practitioners, the Representative Body instructs the Council to press for the enforcement of the three years' mimimum course of study in recognised medical schools before non-nationals can be admitted to the Medical Register of the United Kingdom.

He quoted figures in support of his division's apprehension and was supported by Mr. McAdam Eccles, who thought altruism could be carried a little too far. Sir Henry Brackenbury pointed out that only the Licensing Bodies had any power in this matter, and all of them except the Scottish Colleges were agreed on this resolution. The B.M.A. had no power over them, but could, of course, express an opinion. The Chairman of Council was anxious that this motion should not suggest that the Association had been idle in this matter; it had done everything in its power. —Mr. Bishop Harman said that the Association had never gone straight to the Scottish Colleges and told them the opinion of the profession. Torquay agreed to put its resolution in the form of an instruction to take this direct action, and thus carried it.

Scotland

Dr. J. B. Miller presented the Annual Report under Scotland. Among other activities the Committee had, he said, given evidence on the training of nurses. A great change had taken place in nurses' training since 1929 and it was possible for a girl to go through her full training without ever nursing pneumonia, which was now treated in municipal hospitals. She could only get a full training by moving from hospital to hospital for about eight years. The Association had recommended a period of five years and three months, the first year to be an academic one which could bridge the gap between school-leaving certificate (recommended as the standard of entry) and hospital work. A pension scheme had been urged. Free choice of consultant had now been ensured for Scottish teachers.

Dr. E. R. C. Walker proposed for Aberdeen, and the Chairman of Council accepted, that :—

> "In view of the new ideas on the administration of Health Services which developed in the course of the preparation and giving of Evidence on behalf of the Association by the Scottish Committee before the Departmental Committee on Health Services, it be remitted to Council to reconsider and, if necessary, revise that part of the Association's General Medical Service Scheme for the Nation which deals with the administration of Medical Services."

The units, he said, rarely corresponded with any local authority, and some coördinating mechanism was needed. He deprecated the establishment of yet another committee to deal with medical services and did not think a local authority was properly equipped for this function. "For forms of government let fools contest; whate'er is best administered is best," he concluded.—Sir Henry Brackenbury thought the proposition was a possible one for Scotland but impossible for England and Wales.—Dr. R. A. Picken did not agree, but the Chairman ruled that it was being considered for Scotland only.—Dr. G. Dunlop (Glasgow) said the position of Scottish negotiators would be made very difficult if the motion were not passed.

Medical Education

Sir Henry Brackenbury proposed the approval of the report of the Medical Education Committee, including its special curriculum recommendations.[1] The committee observed with approval several recommendations made to the General Medical Council by its own committee, but noted that a few were not in accordance with the Association's views. Every observation made by the B.M.A. would be taken into serious consideration by the G.M.C. in November. Dr. R. K. Robertson (Sheffield) did not agree that the minimum age for registration should be 18, as the course was already long and some people were older at 16 than others at 20. The Chairman said he thought this report was one of the finest reports on education that had ever been produced, and it was very largely due to Sir Henry Brackenbury. The motion of approval of the report was carried with acclamation.

Dr. Mona MacNaughton proposed for Newcastle :

> "That in arranging the curriculum for students, steps should be taken to ensure that they have a course of instruction with an approved general practitioner after their qualifying examination, but before they are entitled to register."

She thought that this would greatly increase the efficiency of the practitioner. The art of medicine was found in no text-book and was invariably learned by the young doctor from his elders and betters. Minor ailments and treatments, early signs of disease, the working of the National Health Insurance Acts and the business side of practice could only be learned this way. Moreover, the training would be invaluable for those who were not going into general practice, and would lead to better coöperation between the different branches of the profession afterwards. It could never be in the public interest that a doctor should take on a practice single-handed the day after qualification. Loud and prolonged applause greeted her speech and Sir Henry Brackenbury agreed with every word of it except her hope that the motion would be passed. The recommendation could not be carried out at the present time, he said. The Committee thought the period of responsibility should be within the five years' curriculum; nor was it convinced that service as an assistant was the sole means of acquiring responsibility under supervision. At the moment the curriculum should not be prolonged for this purpose. Newcastle refused to withdraw the motion.—The Chairman of Council expressed agreement with both parties and advised the Representative Body to move to the next business, which it did.

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[1] The Lancet, 1934, i., 905.

MEDICINE AND THE LAW

With all Due Respect

It is our national habit proudly and gladly to honour our judges. Especially do we hold in regard the Lord Chief Justice of England. His judicial reputation laymen must leave to the Court of Appeal. Even laymen, however, can appreciate his sincerity of purpose and his happy gift of eloquent exposition. The medical profession in particular can recall several judgments which have revealed his intimate understanding of the responsibilities of surgeons and physicians. We hope then that we may attribute to some mere hot-weather aberration a brief incident reported from the Central Criminal Court last week. A man named Quarry was being tried for the wilful murder of his wife. The defence was epilepsy. A specialist in mental disease, called by the defending counsel, stated that he had examined Quarry in prison and that in his opinion Quarry suffered from epilepsy; during an epileptic attack, he explained, the patient would not know what he was doing or whether it was right or wrong. Then followed this question from the bench:—

The Lord Chief Justice: "I want you to answer this 'Aye' or 'Nay.' Did you not go to see the prisoner on July 6th for the purpose, if possible, of swearing afterwards that he was epileptic?"

The Witness: "Certainly not."

Members of the public, we find, confirm the view that Lord Hewart's question conveyed the suggestion that a medical witness was ready, for payment; to swear what was wanted rather than what was true. If that is the innuendo, we profoundly regret an inurbanity which must render uncomfortable the future appearances of medical witnesses in Lord Hewart's court. The question was one which we should hope that few judges would permit to be put by counsel to a professional witness. When it is put directly from the bench, the apparent discourtesy affronts the whole profession.

There are legal entomologists whose humour it is to collect and classify the bees that sometimes buzz within the judges' bonnets. No evidence of judicial apiculture will ever make us reverence our judges one whit the less. The murmurous hum of little wings is happy proof that the almost supernatural beings who wear the ermine are of the same human clay as ourselves. We still look to them to be the guardians of our ancient liberties, to sound from the church tower the tocsin warning us against the encroachments of the bureaucracy, no matter what bats are in the belfry. As the recent case at the Old Bailey reminds us, Lord Hewart has not infrequently attacked the medical attitude towards criminal responsibility. Of this we have no complaint whatever. Let it be granted that the law is crystal clear and that the foolishness of doctors merely befogs it. The doctor is brought into court to provide the material of facts and opinions out of which lawyers on one side or the other will spin their legal arguments. Undoubtedly there are two aspects of the problem of crime and insanity. Undoubtedly, when the issue is the nature and degree of the patient's malady, the origin, development, and treatment of his abnormality, then the medical view is entitled to consideration. When the issue is the accused man's responsibility under the law, then Parliament, the judges, and the Home Office must have the last word. On the existence, the symptoms, and the physical effects of epilepsy doctors are entitled to be heard. The difficulty of diagnosis, the risk that dangerous criminals may go unpunished through the success of a too facile defence—these are matters on which any judge may justifiably insist. It will hardly be denied that the law prefers to stand still while the science of medicine aspires to gradual progress. In 1922 a Lord Chancellor set up a committee to consider what changes, if any, were desirable in the existing law, practice, and procedure of criminal trials where the defence of insanity is raised. A distinguished judge, Lord Atkin, presided over the committee; its membership admirably blended the wisdom and experience of the bench, the Home Office, and the experts who are concerned to prosecute in criminal cases. The committee found that changes were desirable. Legislation, it observed, might be necessary. No such legislation has since been passed; the desirable changes are not yet made. While the law thus stands, we cheerfully admit that it is the exclusive function of the judges to expound it. It may well be their duty to remind us that in a court of law it is the legal, not the medical, view which must prevail. But it will be a matter of profound disappointment and surprise if this judicial task cannot be performed without discourtesy. May we beg for some token that the offensive question will not recur? If there were not a prejudice against judicial journalism, we could respectfully have offered Lord Hewart the hospitality of our columns for the purpose. As things are, we look anxiously for some reassurance that medical witnesses can continue to give evidence in his court without apprehension.

Alleged Food Poisoning

In Cattermole *v.* Marks and Spencer, Ltd., the plaintiff failed last week in a claim for damages for alleged breach of implied warranty that a tin of peas bought at the defendants' shop was fit for human consumption. Her case was that she opened the tin, washed and cooked the peas for the Sunday luncheon of her husband and herself. The other food consisted of chicken, potatoes, fresh greens, stewed fresh plums and cream. The husband did not eat the peas and suffered no ill-effects; she herself ate freely of them and after a few hours felt very ill. Next morning a rash developed. On the Wednesday her doctor diagnosed food poisoning: for some days she was acutely ill, her face was swollen and the rash spread all over her body. After six months her doctor was still attending her. The defendants suggested that she suffered from acute dermatitis, possibly caused by some external agent such as a hairwash; but the plaintiff and her hairdresser repudiated this explanation. The defendants proved that they bought all their tinned peas from a Stratford-on-Avon firm, their purchases exceeding two million tins and this being the first complaint. Analysis of similar tins of peas showed no living bacilli or spores. The modern methods of cleaning and sterilising fruit in the canning industry were explained. It was contended that, if anything went wrong with the peas, the harmful results could not be limited to one tin, since the contents of 600 tins were prepared at the same time; the only risk would be from a "blown" tin where the fault would be in the metal, not in the fruit, and where the peas would have a frothy look and the taste of them would at once show that something was amiss.

Mr. Justice Lewis was satisfied that Mrs. Cattermole had suffered as alleged, but he said it did not follow that her claim could succeed. A rash of the skin could result from eating food perfectly fit for human consumption, through some idiosyncrasy of the person eating it. The judge was impressed also by the absence of vomiting and diarrhœa. He could not disregard the evidence of the precautions taken by the canning firm at Stratford-on-Avon. He was satisfied that their methods were scientific and up to date and that the possibility of contamination was extremely remote. He found that the plaintiff had failed to make out her claim. His judicial tribute to the manufacturers' methods will be valued by the British canning industry, which has been fostered and developed by the Ministry of Agriculture. Counsel for the defendants was at some pains to combat the impression that tinned food was more likely to be harmful than fresh food. Nowadays, he claimed, scientific preparation and sterilisation caused tinned food to be less likely to contain poison than fresh food.

INTERNATIONAL NEUROLOGICAL CONGRESS

THE FIRST DAY'S PROCEEDINGS

NEUROLOGISTS from forty-two countries met at the Second International Neurological Congress which was held in London this week. The congress was opened by the president, Dr. GORDON HOLMES, F.R.S., who laid stress upon the necessity for international coöperation as the basis of progress in truth and knowledge.

The Epilepsies

The first day was devoted to a discussion of the epilepsies.

Prof. JEAN ABADIE (Bordeaux) remarked upon the striking change in the conception of the nature of epilepsy which had occurred during the last fifty years. Epilepsy was no longer regarded as a true disease, but merely as an anatomo-clinical syndrome. He considered that it was neither constitutional nor innate, but personal and acquired. It was not a neurosis without an organic substratum but a syndrome always the result of cerebral lesions, however variable their nature. The commonest causes were lesions of the brain produced by obstetrical injuries, cranio-cerebral injuries occurring in childhood and the toxi-infective states of infancy, among which congenital syphilis was specially mentioned. It followed that there was a real ætiological link between epilepsy and infantile convulsions.

Dr. WILLIAM G. LENNOX (Boston) described the results of some striking investigations which had been carried out in his own laboratory. He considered only the rôle of the cerebral circulation and of oxygen metabolism in the production of epileptic convulsions. The flow of the blood through the brain had been recorded in 10 patients. There was no decrease in the blood flow before the convulsion and no evidence in support of the time-honoured theory that an epileptic attack was the result of generalised cerebral arterial spasm. Nor was there any evidence that anoxæmia was a cause, though in 13 patients who suffered from petit mal an attack could be induced by anoxæmia, and it had been shown that a raised oxygen tension in the blood of epileptics diminished the ease with which convulsions could be produced by over-breathing. Dr. Lennox said that hitherto there had been no method of discovering what was happening to the cerebral neurones themselves during an epileptic fit. This gap in our knowledge had now been filled by electro-encephalography, a method of recording changes of electrical potential within the brain. Records had been made from the brains of 31 patients, who all showed abnormal waves beginning before the attack and increasing in amplitude during the attack. No waves were visible during the phase of post-epileptic stupor. Petit mal seizures were invariably preceded or accompanied by a burst of electrical potentials of about ten times the voltage and about one-fifth the frequency of the patient's usual potentials. The form of the large waves was individual for each patient. Furthermore, the electro-encephalograms of patients recorded during phases of freedom from attacks showed similar but smaller disturbances of rhythm suggestive of larval or sub-threshold seizures. The interpretation of these phenomena was uncertain, but it appeared that during an epileptic attack an abnormal synchronisation of nerve impulses occurred and there was an integration in time, so that the harmony of the symphony orchestra was reduced to a single note.

Prof. E. A. SPIEGEL (Philadelphia) said that the fundamental mechanism in the pathogenesis of convulsions must be sought in alterations in the excitable nervous elements themselves. Excitation had been attributed to changes of ion concentration on semi-permeable cell membranes. As a result of the semipermeability polarisation phenomena occurred that could be used to measure changes in permeability. It had been found that states productive of convulsions—such as asphyxia, anæmia and increased intracranial pressure—caused a fall in conductivity of the brain, but the opposite effect was produced by narcotics.

Dr. F. FRISCH (Vienna) discussed the rôle of disordered metabolism in the production of epileptic attacks. He emphasised that metabolism played essentially a dynamic part and said that the typical feature of the metabolism of the epileptic was its lability. Changes had been described in many metabolic functions. There was often a preparoxysmal depression of nitrogen excretion in the urine. The metabolism of water and of salt had an important bearing upon changes in colloidal structure. The acid-base ratio had also been investigated, and it had been shown that alkalosis, in the sense of deviation of the actual reaction of the blood towards the alkaline side, was an important ætiological factor in precipitating the epileptic attack. There was as a rule a preparoxysmal diminution in the alkali reserve. A problem of current interest was the question whether sugar metabolism had any bearing upon the ætiology of epilepsy. The importance of metabolic changes lay in the fact that the excitability of the ganglion cells of the nervous system was a function of the chemical organisation of the cell.

Dr. K. ORZECHOWSKI (Warsaw) discussed the part played by the vegetative nervous system in the pathogenesis of epilepsy. He said that in genuine epilepsy the final and immediate cause of the attack was vascular spasm, the localisation of which determined whether the attack was epileptic, narcoleptic, or took some other form. None of the changes which might precede the attack, whether hormonal or vegetative, chemical or hæmatological, were peculiar to epilepsy, and hence they could only act as precipitating factors. In epilepsy proper the spasm occurred in the cortical vessels; in narcolepsy in those of the base of the brain; in pyknolepsy in the vessels of the cerebellum. The anatomical substratum of epilepsy was the complex pia-arachnoid—vasomotor nerves—vessel.

Prof. M. MINKOWSKI (Zurich) reviewed the pathological anatomy of epilepsy. He said that in patients who had died of status epilepticus recent changes were found in the tissues of the nervous system. The vessels of the brain showed congestion. The ganglion cells of the parenchyma of the nervous system exhibited acute degenerative changes in the form of chromatolysis and swelling. Changes were also found in the neuroglia and in the choroid plexuses and the ependyma of the ventricles. In epileptics in whom the disease was of long standing proliferation and thickening of the walls of the cerebral vessels was found. In the nervous parenchyma there was the well-known sclerosis of the cornu ammonis, and elsewhere, especially in the cerebral cortex, were alterations of a degenerative, atrophic or sclerotic character. Chronic changes had also been described in the glia and in the choroid plexuses. In the meninges a serofibrinous or cystic arachnoiditis had been noted. Persistence of the thymus and various chronic changes in the endocrine organs had been described.

Dr. A. Ulrich (Zurich) discussed the medical treatment of epilepsy. The administration of bromide had been controlled by an accurate estimation of the bromide content of the blood. It had been found possible to correlate the bromide level with the degree of narcosis produced in the patient. The antagonism between bromide and chloride had been investigated and it had been found that when twice or three times as much sodium chloride as bromide was administered symptoms of bromide intoxication did not appear. The bromide in the blood must be maintained at a level which depended upon the severity of the epilepsy.

Prof. Wilder Penfield (Montreal) spoke on the surgical therapy of the epilepsies. He pointed out that a focal lesion of the brain was present even in cases of so-called idiopathic epilepsy more often than was generally supposed. When the history, the presence of abnormal physical signs in the nervous system or the pattern of the attacks suggested the possibility of a focal lesion an encephalogram should be carried out and an attack observed. When the brain had been exposed at operation the cortex should be investigated by electrical stimulation. The lesions which lent themselves to surgical treatment were a scar uniting the meninges to the brain and areas of focal cerebral atrophy and cicatrix. The excision must be made through normal brain tissue and should, if possible, reach the ventricle. Of 22 patients treated by radical excision of a meningo-cerebral cicatrix 10 had remained free from attacks, and 7 were markedly improved. In another 22 cases radical excision of areas of focal atrophy and focal cerebral cicatrix had been performed, and of these patients 9 were free from attacks and 7 were improved.

Dr. M. Sgalitzer (Vienna) described favourable results achieved in epilepsy by X ray irradiation and the technique he employed.—Dr. L. J. J. Muskens (Amsterdam) referred to the difficulties of treating epileptic patients at general hospitals and the advantages of special institutions for this purpose.—Dr. H. Urban (Vienna) gave an account of the therapeutic effects of the lumbar insufflation of air and the intracarotid injection of thorotrast.—Papers were also read by Dr. A. E. Kornmüller (Berlin), Dr. A. Schüller (Vienna), and Prof. G. Stiefler (Linz), and Prof. Otto Marburg (Vienna) summarised the discussion.

Battersea General Hospital.—Six wards of this hospital, which had been closed for lack of funds, were reopened on July 29th through the generosity of Mr. S. E. Parkes, chairman of the board of governors. Mr. Parkes has given the hospital £10,000.

LIFE ASSURANCE MEDICINE

THE INTERNATIONAL CONGRESS

Representatives from all over the world were attracted to the triennial Congress of Life Assurance Medicine held last week in London at the offices of the Prudential Assurance Company. Besides the medical meetings the programme, which extended from July 23rd to 27th, included a reception by the Minister of Health at Lancaster House, a banquet at the Dorchester Hotel, and a reception by Sir Edgar Horne, chairman of the Prudential Assurance Company.

Methods of Estimating Risks

The first of the medical meetings was given to a discussion on methods of estimating risks. Reviewing the main points to be considered in the general estimate of risks, Dr. Josef Sturm (Munich) laid stress on the importance of the "moral standing" of the applicant, the relationship of his financial position to the sum proposed, and the possibility of any speculative element about the assurance. The assessment of substandard risks involves in the first place the medical estimate of the degree of impairment present, and for this purpose the experience gained from statistical work has been of great value in enabling insurance protection to be extended more and more to lives which have hitherto been uninsurable. Dr. Sturm proceeded to discuss the three methods most commonly used in the technique of extra rating:

(1) the imposition of an extra premium during the whole or only a part of the term of the policy;

(2) addition to the age of the proposer; and

(3) limitation of capital payments—this limitation continuing throughout the term of insurance or being wiped off during the earlier years of the policy. An example of this last form of limitation is the "one-fifth graduation policy" which implies that when death occurs in the first policy-year the company pays only one-fifth of the assured sum, in the second year two-fifths, and so on, with the result that after five years the whole sum becomes due in the event of death. This system has the advantage of not involving an extra premium.

Dr. Chester T. Brown (Newark, N.J.), began by describing the fundamental work of Dr. O. H. Rogers and Mr. A. Hunter whose "numerical system" for estimating risks resulted about forty years ago in the statistical approach to life assurance problems gradually supplanting the clinical. The extent of the dependable information on which modern practice rests is illustrated by the fact that the Medical Impairment Study published experiences in 1931 concerning 2,100,000 lives, one-third of which were classed as substandard. Dr. Brown proceeded to describe in more detail the working of the numerical (or statistical) method; debit and credit marks are given to the proposer under a variety of headings, such as build, family history, occupation, and habits.

Prognosis of Hypertension

The second meeting opened with a communication from Dr. Etienne May and Dr. Jean Ollivier (Paris), who pointed out that even moderate increases in blood pressure had long been held to involve a considerable increase in the risk to assurance companies; whereas private statistics gave an impression of much less gravity. The available statistics were open to two criticisms. First, the majority of them are based on systolic pressures only, since until quite recent times few observers have paid attention to the diastolic pressure. Secondly, being mass statistics they combine in the same group all individuals with the same systolic pressure whatever the cause of the hypertension and whatever its clinical type. For accurate assessment separate statistics, graded according to the clinical type of hypertension, are essential. Three main types may be differentiated: (1) Systolo-diastolic or complete hypertension; (2) the hypertension of arterio-sclerosis with systolic predominance; and (3) hypertension with systolic predominance associated with neuro-vegetative instability. In complete hypertension the rise in systolic pressure is secondary to the rise in the diastolic, and there should be a fairly constant relation between the two. Extra risk is indicated by convergence (usually due to weakening of the heart) or by divergence (indicating arterio-sclerosis). As the rate of development of hypertension is important it is advisable to defer acceptance for several months so that this may be estimated in a second examination. In arterio-sclerotic cases, attention must be paid to the condition of the kidneys and myocardium and local forms of arteritis must be looked for. The hypertension of neuro-vegetative instability may exist by itself but is commonly associated with hyperthyroidism and tachycardial neurosis. It is found in young neurotic subjects and in women at the menopause. Even when occurring with a fairly high maximum it is essentially a variable and benign hypertension. The prognosis depends more on the associated neuro-vegetative instability than on the hypertension, and in practice a margin of 10 mm. may be allowed for the systolic and 5 mm. for the diastolic pressure without extra premium. A small extra premium is required for higher readings because of the unstable nature of the condition and the theoretical possibility of its developing into a complete hypertension. In the obese, when hypertension yields readily to diet, a moderate extra is sufficient; but when it cannot be reduced the strain on the heart is such that heavy loading is necessary.

Prof. WINTERNITZ (Trieste) also emphasised the importance of the classification of hypertension according to its cause. All applicants with hypertension of renal origin should be excluded and the selection subsequently checked by a study of the cause of death; a high frequency of uræmic deaths indicating faulty selection of material. He also called attention to the importance of examining the optic discs for evidence of albuminuric retinitis, and of the electrocardiogram, without which early lesions of the cardiac muscle cannot be detected. Although the diastolic pressure might be useful in prognosis, Prof. Winternitz had so far found its value uncertain because of the difficulty of obtaining exact readings.

In the discussion which followed, several speakers agreed in regarding uncomplicated and moderate hypertension as relatively benign. Dr. TOMASSON (Iceland) found the mortality in complete hypertension six to eight times as great as when the systolic pressure only is affected.

Acceptance of Diabetics

SIR WALTER LANGDON-BROWN, president of the Congress, opened the morning session on July 25th with a paper on The Acceptance of Glycosurics. There is no doubt of the increased prevalence of diabetes, he said, and the increase is of particular interest to assurance companies on account of its tendency to affect well-off people who insure their lives heavily. The effect of insulin has been to produce a fall in the death-rate in the young diabetic which is compensated by an increased mortality in the elderly. In life assurance work, when sugar is found in the urine, the onus of proving that the glycosuria is benign rather than diabetic rests on the proposer, and the necessary blood-sugar estimations, being in any case to his advantage, should be carried out at his expense. Sir Walter had hoped that blood-sugar curves would solve all diagnostic difficulties but, as Dr. Batty Shaw had recently pointed out, biochemists are now prepared to admit that anxiety, excitement, and diet may so far influence a curve as to make the diagnosis difficult. The small mumber of intermittent glycosurics who subsequently develop diabetes justifies their acceptance, but proved diabetics remain uninsurable, since their lives depend on their maintaining proper treatment, and even when controlled they are abnormally liable to sepsis, tuberculosis, and arterio-sclerosis.

A joint paper by Prof. HIJMANS VAN DEN BERGH and Prof. C. DE LANGEN was read by the latter. They pointed out that although life assurance companies were commercial institutions their fundamental principle was humanitarian, and in actual fact substandard proposers were more in need of insurance than the perfectly sound who were likely to exceed the average duration of life. They suggested that it may be advisable to accept, suitably loaded, proposers with uncomplicated diabetes provided that personal and social conditions are favourable. Renal glycosurics should be accepted at ordinary rates.

In the subsequent discussion, Dr. CHESTER BROWN described a rapid method of blood-sugar examination. Dr. BATTY SHAW called attention to the fact that assurance companies lost heavily from diabetes in candidates who had no glycosuria on acceptance, whereas the deaths from diabetes amongst those loaded for glycosuria were few.

Peptic Ulcer

In a paper on gastro-duodenal ulceration and life assurance, Prof. ROMANELLI (Rome) remarked that although the disease was increasing, we were still without statistics reliable enough for a proper assesment of its mortality. The diagnosis may easily be made difficult if the proposer conceals his symptoms, since definite objective signs are often absent. Radiological examination is not always easy to obtain, but Prof. Romanelli suggested that large towns should be equipped for this purpose. The prognosis depends on the general condition of the proposer and the time elapsed since his last symtoms; if pain is present the risk should be deferred; after six months it may be accepted with a heavy load. Better rates may be given after five years of good health, but a proposer with a history of gastro-duodenal ulceration should never be accepted at normal rates.

Dr. FAROY and Dr. CARRIÉ (Paris), in a joint communication, also lamented the incompleteness and misleading nature of statistics concerning gastro-duodenal ulceration. They believe the total death-rate in these cases to be about 23 per cent. although it seems to be considerably lower in cases treated medically for a long period (Moutier 5·17 per cent). Surgical treatment, in skilled hands, gives excellent results (48–65 per cent. cures), but late complications, such as the appearance of jejunal ulceration, are common. Being a serious and recurrent disease, gastro-duodenal ulceration always entails an increased risk and a short-term contract. It is to the advantage of companies to require that such policy-holders should present themselves for periodic examinations, and for this purpose it is essential for them to possess clinical, radiological, and laboratory facilities.

Dr. Arthur Westerman gave it as his opinion that after five years of good health a candidate could be accepted at normal rates. Dr. Chester Brown considered the danger of relapse to be greater after surgical than after adequate medical treatment.

Periodic Examinations and Medical Care

Dr. S. B. Scholz, Jnr. (Philadelphia), opening the session on health service and life assurance on the 26th, began by describing the beginnings and the growth of the system of periodic examinations of insured persons inaugurated by assurance companies. Following a suggestion made in 1861 by Dr. Horace Dobell of London, the movement began with the Provident Life Assurance Society of New York which established a health conservation bureau in 1909; this was followed in 1913 by the foundation of the Life Extension Institute which now carries out the health service of a large group of companies. At present more than a third of the American companies provide some form of free health service. Friendly societies in America provide not only health service and life assurance, but for many years have had a sanatorium for the treatment of those of their members who contract tuberculosis.

Dr. Otto Neustätter (Berlin) spoke of the spread of health service from the United States to more than twenty other countries in the last twenty-five years. Health service might be divided into two types: prophylactic, which included education campaigns by means of leaflets, lectures, and films; and therapeutic, which included visits by nurses and also financial assistance in cases of illness. He estimated, from figures obtained in America, Germany, and Japan, that periodic examinations would lead to prolongation of life in about twenty five per cent. of cases.

Other Problems of Assurance

The final afternoon session was occupied by a series of short communications.

Prof. Bergstrand (Stockholm) read a paper on the possibility of diminishing premiums by estimating risks. He began by saying that assurance companies were to be looked on less as a trade than as a social service. There was an admirable tendency in modern times to widen the portals of entry. Whereas in 1870 only 60 per cent. of proposers were accepted at ordinary rates this figure had risen to 95 per cent. in 1933; 3 per cent. showed an expected mortality up to seventy per cent. and were accepted at an increased premium, and only 2 per cent. were rejected.

Dr. L. Wagner (Berlin) spoke of the advantages of an X ray examination in assurance work; many serious diseases, which provided no abnormal physical signs, could easily be detected by this means.

Dr. H. J. Coert (The Hague) gave the results of a statistical inquiry he had made regarding the mortality of insured diabetics. Considering patients with a small amount of sugar in the urine and no complications, he found those of average weight showed a mortality of only 94 (normal 80), whereas the overweight members of the same group had a mortality of 252.

Dr. Augusto Bunge (Buenos Aires) spoke on the joint organisation of medical examiners, which has proved a useful system in the Argentine Republic where vast thinly populated areas have to be dealt with. Fraudulent attempts are best met by coöperation between assurance companies and the appointment of a relatively small number of reliable examiners. The lengths to which criminal ingenuity can go was well illustrated by a case in which a man dying from tuberculosis was impersonated by a healthy person accepted as a first-class life. The imposter proceeded to stage a death from pneumonia, with the assistance of a doctor, who was also the assurance company's examiner.

In closing the congress the president spoke of the high place which assurance now occupied in scientific medicine. He thought the main problems for the future were concerned with the extension of the benefits of assurance still further to substandard lives. Among other drawbacks, total rejection had a bad psychological effect.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 20TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1549; diphtheria, 956; enteric fever, 44; acute pneumonia (primary or influenzal), 472; puerperal fever, 36; puerperal pyrexia, 116; cerebro-spinal fever, 9; acute poliomyelitis, 7; acute polio-encephalitis, 1; encephalitis lethargica, 5; continued fever, 1 (Birmingham); dysentery, 19; ophthalmia neonatorum, 96. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council, on July 26th was 2576, which included: Scarlet fever, 729, diphtheria 965, ; measles, 43; whooping-cough, 399; puerperal fever, 20 mothers (plus 5 babies); encephalitis lethargica, 269; poliomyelitis, 2. At St. Margaret's Hospital there were 19 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) enteric fever, 9 (0) from measles, 3 (0) from scarlet fever, 17 (1) from whooping-cough, 15 (4) from diphtheria, 45 (8) from diarrhœa and enteritis under two years, and 19 (2) from influenza. The figures in parentheses are those for London itself.

No general increase is reported in the deaths from diarrhœa and enteritis; Liverpool reported 9, Birmingham 4, no other large town more than 2. Of the fatal cases of measles 4 occurred at Liverpool. Of the 16 deaths from whooping cough outside London 4 occurred at West Ham, 2 each at Birkenhead, Leeds, and Liverpool.

The number of stillbirths notified during the week was 290 (corresponding to a rate of 42 per 1000 total births), including 44 in London.

Grantham Hospital.—The six private wards built as part of the extensions to this hospital are now complete. The charge is £5 5s. a week, and subscribers of £2 2s. a year, whose income exceeds £8 a week, are entitled to 15 per cent. reduction, and those whose income does not exceed £8, to a reduction of 25 per cent. Pay-beds are also available in the children's wards.

Gifts to Hospitals.—Mr. E. W. Meyerstein has given an additional 25 acres of land to secure the skyline of the future site at Banstead Wood, Surrey, of the Princess Elizabeth of York Hospital for Children. He has already given £10,000 to the institution. Mr. Meyerstein has also given £12,000 to the London Hospital to provide a swimming bath for the nurses. His further gifts to the Middlesex Hospital medical school were announced at the centenary celebrations reported elsewhere.

THE MEDICAL DIRECTORY

UNCOMMUNICATED ADDRESSES

THE Editor of the "Medical Directory," 40, Gloucester-place, Portman-square, London, W.1, desires to notify members of the medical profession that certain of their number, whose names appear below, have not communicated to him their present address. He asks that the persons in question, or their friends, will kindly give him the information at once, and in any case not later than Sept. 2nd. Otherwise the words (*address uncommunicated*) will appear in lieu of an address in the forthcoming 1936 issue. The date of registration is shown in parenthesis.

Absher, Chas. Omer (1930).
Adair, Thos. McCormac (1895).
Ahmad, Rasheed (1931).
Aikman, Cedric Wm. (1914).
Aiyengar, S. N. S. (1910).
Albertijn, Lindley (1918).
Albiston, Norman Arthur (1925).
Alexander, Andrew (1885).
Allan, Hamish (1932).
Allan, Wm. (October, 1926).
Allan, Wm. Smith (1905).
Allen, Vincent Ernest Nicol (1928).
Allen, Wm. Guy Embleton (1915).
Amarasinghe, Harmanis (1924).
Anderson, Abner Gallie (1916).
Anderson, Jas. Coburn (1915).
Anderson, Jas. McLaren (1928).
Anderson, Mary (1931).
Annett, Robt. Cecil (1929).
Ansari, Obaidullah M. T. (1933).
Appleyard, Herbt. Ernest (1933).
Archibald, Douglas (1925).
Arnold, Wm. (1885).
Asbury, Robt. Andrew Jacomb (1900).
Ashley, Tom John (1931).
Ashton, Fredk. Ieuan (1930).
Atkey, Oliver Francis Haynes (1903).
Atkinson, Thos. Reuell (1881).
Aubrey, Harold Percivall (1907).

Bailie, Wm. Herbt. (1923).
Baindur, Ramchandra Subrao (1930).
Baker, Helen (1932).
Ball, Godfrey Dacre Jennings (1927).
Ballantyne, John (1896).
Bannister, Marmaduke (1887).
Barkley, Jas. (1899).
Barnabas, Thos. Alfred (1929).
Barns, Wm. Norman Winston (1932).
Barr, Jas. (1928).
Barrett, Ernest (1886).
Barzilay, Abraham Hy. (1929).
Basham, Sydney (1923).
Bastible, Michael John (1925).
Basu, Amiya Kumar (1931).
Bates, Hy. Leslie (1880).
Battista, Rebizzi (1930).
Baxter, Geo. Savage Martin (1882).
Baxter, Jas. Sinclair (1929).
Beaugié, Donald McNicoll (1932).
Behari, Raghunand (1930).
Bell, Harry Chas. Rikard (1932).
Bell, Howard Alex. (1914).
Belletty, Dudley Rideout (1929).
Bennett, Fredk. Joseph (1879).
Bennion, Edgar Rhodes (1924).
Bensted, Lewin (1896).
Berg, Hendrik Jacobus van den (1927).
Bergouignan, Paul Theodore Gustave (1913).
Bernard, Robt. Spence (1892).
Bhatt, Prabhulal Devshanker (1932).
Bingham, Chas. Albert (1924).
Binnie, John Fairbairn (1886).
Bisset, Ian Gordon (1914).
Blair, Alex. (1903).
Blair, Hy. (1932).
Blewett, Chas. Hy. (1932).
Bolger, Patrick Thos. (1887).
Bond, Hopetoun Edwd. (1910).
Bonin, Adrien (1911).
Bonis, Robt. Jas. (1908).
Booth, Sydney (1894).
Bortz, Abraham (1926).
Bouché, Benjamin Jasper (1930).
Bourke, John (1927).
Boyd, John Ellison (1924).
Bradshaw, Desmond Burton (1932).
Brady, Patrick (1900).
Breen, Michael (1923).
Brown, Elizabeth Evelyn (1921).
Brown, Richd. (1891).
Brown, Wm. (June, 1933).
Brown, Wm. Aelred (1923).
Browne, Fredk. Guy Fountain (1912).
Bruce, Edna Winifred (1925).
Bruce, Hugh Gilbert (1912).
Bruce, Margaret Cruickshanks (1924).
Buchanan, Marion Elizabeth (1930).
Burke, Ulick Joseph (1897).
Burnett, Chas. (1924).
Burnett-White, Margaret Catherine (1924).
Burrows, Thos. Eggleston (1932).
Burwell, Fredk. Norris (1887).
Butterfield, Geo. Richd. (1933).

Cambridge, Wm. Russell (1933).
Cameron, John Austen Percival (1929).
Cameron, Patrick Stephen Gerrard (1918).
Campbell, Angus (1893).
Campbell, Gertrude Jane (1900).
Campbell, John (1922).
Campbell, John (1928).
Carr, Meyer (1934).
Carrington, Geo. Hedwig (1884).
Cassidy, David Mackay (1868).
Chadsey, Louis Colvin (1929).
Chambers, Wm. Huntley (1934).
Chandrasekharan, Trichinopoly (1932).
Cherry, John Douglas (1913).
Cheune, Nai (1913).
Chilton, Chas. (1899).
Chisholm, Alex. Fraser (1925).
Chopin, Leopold (1922).
Clark, Wm. Adam (1929).
Clarke, David Dickie (1926).
Clarke, Roy (1934).
Clements, John Hall (1902).
Coghlan, John Joseph (1920).
Collier, Samuel Ruddell (1887).
Colombowala, Munchersha Rustomjee (1903).
Condon, Richd. A. (1921).
Conlin, Arthur Joseph (1926).
Conlon, Peter (1922).
Connolly, Peter John (1922).
Constad, Victor (1932).
Constant, Chas. Fredk. (1912).
Consul, Shiamnath (1931).
Cook, Duncan (1917).
Coomber, Arthur Beauchamp (1907).
Cooper, Edwd. Harold (1896).
Corcoran, Jeremiah Joseph (1927).
Corke, Cecil Aloysius (1878).
Corr, Jas. Fairweather (1930).
Court, Edwd. Percy (1899).
Couston, Alastair Gordon (1927).
Coventry, Gladys Anna (1928).
Cowe, Kate Mollineaux (1913).
Craig, John (1895).
Crawford, Chas. Sinclair (1932).
Crossley, Harold Tattersall (1926).
Crowe, Chas. Leask Crawford (1924).
Crowley, Daniel Finbarr (1922).
Crowley, Patrick John (1929).
Csengeri, Giorgio (1934).
Culligan, Edwd. Augustus (1895).
Cussen, Gerald Eugene (1920).
Cutler, Lennard (1889).

Dakin, Thos. Burns (1897).
D'Anna, Antonino (1929).
Das, Upendra Nath (1921).
Davies, Helen Isabel (1923).
Davin, Alfred Lucian Vincent (1916).
Davis, Gerald (1926).
Davis, Randolph (1924).
Deane, Arthur Maslen (1904).
Deaner, Sidney (1927).
Dearberg, John Louis (1926).
Deboo, Sorabji Navroji (1920).
Dickson, Jas. Alan (1930).
Dimond, John Lyn (1900).
Dirckze, Herbt. Augustus (1926).
Dobbie, Edith Dennistoun (1919).
Dodhi, Miss Avabai Jehangirji (1920).
Donadelli, Salvatore (1931).
Dorion, Walter Alphonso (1904).
Driberg, Jas. Douglas (1913).
Duckworth, Herbt. Cecil (1922).
Duff, Alex. Dewar (1928).
Duff, Thos. Francis Aiden (1933).
Duguid, Wm. (1914).
Duke, Francis Vincent (1925).
Dunlop, Eric Fergus John (1929).
Dunlop, Robt. Hunter (1924).
Dunn, Spencer Smithson (1888).
Dunning, John Beatson (1908).
Dyson, Percy Albert Stanley (1909).

Eagles, Victor Thos. Wm. (1912).
Eason, Grace Winifred Wilson (1923).
Eccles, John Yarrow (1925).
Edison, Milton Gray (1933).
Eggo, Mrs. Vivienne Maud (1927).
Elder, Douglas (1905).
Eloff, Johan Sarel (1917).
Elphick, Sidney Ernest (1915).
Elworthy, Hy. Herbert (1904).

Feldman, Harold Moses (1929).
Fenning, John Reginald Keith (1917).
Fenton, Clyde Cornwall (1929).
Ferguson, Malcolm (1892).
Findlay, Wm. David (1895).
Fitzgerald, Alfreda Herworth (1927).
Flower, Richd. Glyde (1926).
Flynn, Joseph Edwd. (1927).
Fogarty, Bridget Mary (1919).
Fogarty, Wm. Philip (1919).
Forgrave, Wm. David (1923).
Forrest, John Geo. Stracey (1877).
Foster, John Wilford (1926).
Foston, Edmund Christopher (1889).
Fowler, Gordon (1893).
Fox, Patrick Joseph (1935).
Franklin, Arthur (1929).
Freeman, Joseph (1899).
Frere, Arthur Hanbury (1889).
Frost, Robt. Oakley (1921).
Frumin, Julius Benjamin (1933).
Fuller, Ralph Christopher (1911).
Fullerton, John Alex. (1925).
Fyffe, Andrew Alex. (1912).

Gaddum, Iris Mary (1924).
Gainsborough, Richd. (1918).
Galler, Herman Frederic (1934).
Galwankar, Gangadhar Dinkar (1933).
Games, John Hy. Paisley (1928).
Gamlen, Harold Ernest (1925).
[illegible] (1931).
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[illegible]
[illegible] (1930).
Gibb, Geo. Alex. (1894).
Gibbs, Eric Worton (1932).
Giblin, Hubert Thos. (1932).
Gibson, Chas. Christopher (1921).
Gill, Cecil Ernest Gaspar (1924).
Gilmour, John Gray (1920).
Glas, Vladimir (1931).
Goggin, Mary (1925).
Goldberg, Isaac (1924).
Goodman, Philip (1925).
Gool, Goolam Hoosen (1931).
Gori, Rosario (1932).
Gourlay, Jas. Dickson (1901).
Gover, John Maxwell (1898).
Graham, Kenneth Jas. Menteith (1928).
Grant, Willoughby Gordon (1911).
Gray, David (1904).
Gray, Harwell Bannerman (1927).
Greene, Samuel S. (1921).
[illegible] Jacobus (1929).
[illegible]

Hacker, Emeric E. (1929).
Hall, Jas. Christian (1920).
Halloran, Kathleen May (1926).
Hamilton, Dennis Godfrey (1928).
Hamilton, Hermann Lauder (1902).
Hamilton, Jas. Oliver (1908).
Hankin, Stanley (1932).
Hardaker, Fredk. Geo. Brunton (1927).
Harris, Clayton Campbell (1886).
Harris, Cyril Robt. (1928).
Harris, David Benjamin Luke (1929).
Harrison, Tillson Lever (1923).
Hart, Jas. Archibald (1922).
Hart, Wm. Hume (1910).
Hartshorne, Bernard Frederic (1884).
Hay, Walter (1887).
Hayward, Lilian Ann (1926).
Heiser, Arthur Lewis (1904).
Henderson, Blanche Aspasie Marion (1918).
Hennell, Leo (1928).
Henry, Geo. Arnold (1933).
Henstock, John Lea (1890).
Hepburn, Aglionby David (1921).
Heron, Wm. (1927).
Hershfield, Harry (1923).
Hetherington, Harry Brown (1926).
Hewett, Samuel Ross De Lap (1917).
Heywood, Thos. (1892).
Higgins, Hubert (1888).
Hill, Isobel Russell (1922).
Hind, Florence Winifred (1914).
Hittleman, David (1933).
Hoffman, Julie Elise (1913).

Hogan, Mary G. (1932)
Holmes, Bernard Willoughby (1896).
Holmes, Joseph (1882).
Home, Fredk. C. H. (1901).
Hopkins, Alex. Wm. (1931).
Horgan, David St. Helier (1909).
Hosny, Mostafa Hassan (1934).
House, Denis Roy (1928).
Howard, Henry (1889).
Hudson, Thos. Albert Gibbs (1920).
Hughes, Mitchell Geo. Herbt. (1932).
Hunt, David Mackenzie (1916).
Hutchinson, Wm. John (1923).
Hutchison, John (1933).

Iles, Mary M. G. (1900).
Irger, Jacob (1932).
Irwin, Mary Ellen (1918).
Iyengar, Mandayan A. P. (1919).

Jack, Alex. Fraser (1900).
Jaensch, Fredk. Joseph Victor (1931).
Jain, Banarsi Das (1927).
Jenner-Clarke, Reginald (1919).
John, Thayil Cheriyan (1932).
Johnston, Hugh Clyde Armstrong (1933).
Jones, David Wm. (1914).
Jones, Evan John (1926).
Jones, Margaret Gray (1921).
Jubb, Archie Vivian (1905).

Karunaratne, Wm. Arthur Edwd. (1918).
Kaul, Sarvashwar Nath (1926).
Keith, Hugh A. (1893).
Kendall, John Wilson (1926).
Kennedy, Francis Patrick (1913).
Kennedy, Fredk. Wm. (1891).
Kesselson, Hyman (1927).
Keyt, Frederic Theobald (1889).
Khan, Abdur Rahman (1934).
Kilroe, Sidney Herbt. Jas. (1908).
King, Gerald Geo. (1928).
King, Jas. Malcolm (1903).
Kirkland, Gerald Baeyertz (1923).
Kirkpatrick, Eileen Monica (1932).
Kirkpatrick, Gordon Mackay (1931).
Krom, Lasar (1934).

Latham, Hy. (1893).
Lawrence, Hy. Gwynne (1896).
Lawrence, Wm. Jamieson (1926).
Leadbetter, Jas. Louden (1896).
Leader, Louis Anthony (1931).
Lee, Alfred Wm. Harris (1882).
Leland, Alfred B. (1898).
Leslie, Wm. (1915).
Levy, Hirsch (1925).
Lewellyn, John Woodruff (1902).
Lewis, John Griffith (1915).
Lewis, Wm. Edward Vaughan (1901).
Liddy, Jas. Christopher Anthony (1929).
Lindsay, Douglas Marshall (1919).
Lindsay, Hugh John Roy (1924).
Lines, Leonora Marie Katherine (1926).
Little, Paul MacDonald (1915).
L'Oddo, Giovanni (1926).
Long, Joseph John (1891).
Long, Kathleen Nicol (1920).
Louwrens, Jas. Johnson (1907).
Lurji, Balbina (1935).
Lyons, Alex. (1901).

MacArthur, Angus Alex. (1928).
MacArthur, Ian Edwd. (1925).
McArthur, Peter Alex. (1924).
McCartan, Patrick (1910).
McCarthy, Cornelius Joseph (1927).
McCarthy, Patrick Bernard (1929).
McClymont, Albert Geo. (1933).
McCormick, Jas. Patton (1922).
Macdonald, Jane Watson (1921).
McDowell, Ernest John Paul (1925).
McEwan, Mary (1923).
McFadden, Mary Taggart (1928).
Macfarlane, Jas. (1921).
McFarlane, Wm. Veitch (1932).
MacGregor, John (1930).
MacIntyre, Edwd. Tambyah (1913).
Mackay, Geo. Munro (1909).
Mackay, Mavis Eveline (1927).
Mackellar, Duncan Gordon (1933).
MacKelvie, Archibald Alastair (1925).
McKenzie, Alan (1920).
MacKenzie, Donald (1928).
MacLaughlin, Thos. (1875).
MacLeod, Sarah Black (1924).
McLoughlin, Douglas Drummond O. (1924).
MacMahon, Edwd. Gerard (1929).
Macphail, Katharine Stewart (1911).
Macpherson, James (1921).
McPherson, Robt. Jas. (1924).
MacQuarrie, Alastair Wm. (1927).
McVittie, John Coulthard (1924).
Marshall, Chas. McIntosh (1926).
Martin, Hy. Oram (1926).
Martin, Jas. Alex. (1899).
Martin, John (1914).
Martin, Louis Chas. (1900).
Marx, Ernst (1934).
Matthews, Hugh Rutherford (1923).
Maurer, Hy. Wm. (1930).
Mazzarella, Gerardo (1930).
Meiring, Sylvester Hy. (1918).
Merry, Jean McMurray (1917).
Meyer, Else Fransiska (1934).
Meyler, John Francis Cooper (1899).
Michelson, Everett Gladstone (1921).
Mikhail, Hakin Murcos (1928).
Mills, Ernest Anthony K. M. (1922).
Mills, John Patrick Tynan (1926).
Mirchandani, Arandram Harumal (1925).
Mistri, Shavax Nasarvanji (1929).
Mitchell, Jas. (1922).
Mitchell, John (1909).
Mohd Aslam (1931).
Moon, Edwd. Gibson (1896).
Mooney, Gerald Wm. (1912).
Mortimer, Hector (1914).
Moynihan, Wm. (1922).
Mudie, Elizabeth Caroline (1925).
Muirhead, Edith Andria (1932).
Muller, Fritz (1934).
Mullins, Wm. Leo (1923).
Murray, Arthur Hill (1881).

Nasmyth, Roy Douglas (1920).
Natali, Claudio (1933).
Nesbitt, Jas. Anderson (1932).
Neylon, Joseph Anthony (1922).
Niaz-ud-Din (1933).
Nichol, Robt. (1892).
Nolan, Jas. Noel Greene (1912).
Nolan, Margaret Mary (1925).
Noll, Sam (1924).
Norrie, Mrs. Cecil Robertson (1909).
Northcott, John Ford (1899).
Nye, Cyril Walter (1929).

O'Brien, Helen (1921).
O'Brien, John Robt. (1898).
O'Byrne, Niall Conor (1932).
O'Connell, Wm. Finbarr (1932).
O'Connor, Nora (1926).
Oddy, John Reginald (1925).
O'Donoghue, Jas. Bennett (1911).
O'Donoghue, Thos. Francis (1915).
O'Donovan, Louis Jerome (1912).
O'Driscoll, McCarthy (1921).
O'Keeffe, Daniel Joseph (1889).
O'Kelly, Patrick (1925).
Ollerhead, Hy. Sandford (1907).
O'Mahony, Joseph Patrick (1926).
Orok, Robt. Dick (1908).
Osborn, Adam Downey (1932).
Ossip, Julius (1932).
O'Sullivan, Daniel Joseph (1918).
O'Sullivan, Peter Finbarr (1922).
Owen, Jas. Raymond (1934).
Owens, Robt. David (1925).

Parbury, Frederic Denis (1902).
Park, Max (1930).
Pearse, Edwd. Mountjoy (1899).
Pearson, Harry Linden (1909).
Philip, Athanas (1920).
Pilley, Evelyn Violet (1922).
Platt, Frank Bertram (1929).
Pollock, Geo. (1932).
Poole, Wm. Joseph (1930).
Port, Arthur Wm. (1893).
Portway, Robt. Louis (1916).
Procter, John Adamson (1893).
Purce, Thos. (1927).

Rajaratnam, Kathirithanby (1930).
Ramsay, Mary Frances (1923).
Randall, Constance Amy (1918).
Rankin, Fredk. Powlett (1914).
Rasanayagam, Suppiah (1929).
Rawson, Doris (1921).
Razdan, Jagmohan Lal (1931).
Reeves, Thos. Conrad (1911).
Reid, Alex. Wm. (1894).
Reid, John Mark (1902).
Reid, Wm. Ewen (1905).
Rekhi, Miss Raseela (1931).
René de Cotret, Gaston T. A. (1920).
Renner, Edowo Awunor (1919).
Reynolds, Leonard Grugeon (1897).
Rice, Chas. Emmanuel (1918).
Richardson, Wm. (1877).
Rifkill, Frank Louis (1923).
Ritchie, Alex. Brown (1889).
Roberts, Adeline Mary (1898).
Roberts, Fredk. Ewart (1925).
Robertson, David Bell (1916).
Robertson, Edwd. Alex. (1928).
Robinson, Amy (1903).
Robinson, John Bainbridge (1928).
Robinson, Thos. Hy. (1885).
Roche, Wm. John (1927).
Rodolph, Geo. Hy. (1907).
Rose, Stuart Mason (1920).
Rosenberg, Wilfred (1927).
Ross, Gordon Winiford (1917).
Rozario, Geo. Stanislaus (1931).
Runciman, Helen (1904).
Rustogi, Hari Krishna B. (1934).

St. John, Alfred Hy. Valentine (1908).
St. Pierre, Damien (1925).
Salmond, Paul Hammersley (1920).
Samarasinghe, Wilmot (1927).
Samuel, Ian Norman (1931).
Santi, Philip Robt. Wm. de (1884).
Santoro, Soccorso (1930).
Saraidarian, Onnik (1928).
Sargent, Wm. Victor (1919).
Saunders, Alison Jean (1923).
Schenck, Edwd. L. E. (1907).
Schneider, Robt. (1935).
Schwartz, Felix (1934).
Scoresby-Jackson, Thos. (1905).
Scott, Geo. Orville (1919).
Scully, Annie (1921).
Scurlock, Stephen John (1924).
Scutt, Tom Homer (1884).
Sharman, Sydney (1927).
Shelly, Chas. Edwd. (1879).
Sheorey, Narayan Lakshman (1915).
Shepherd, Thos. Scott (1900).
Sheridan, Edna Frances (1930).
Sheridan, John Joseph (1921).
Sherry, J. J. Aloysius (1898).
Sidarous, Helana (1930).
Siddiqui, Mohomed Zillur Rahman (1935).
Simon, Keith Myric Benoit (1915).
Simon, Simon Lionel (1923).
Singh, Balwant (1928).
Singha, Miss Abhayabala (1909).
Skeet, Jack Garland (1913).
Smart, Archibald Guelph H. (1906).
Smith, Dorothy Barnard (1932).
Smith, Elizabeth Calderwood (1923).
Smith, Fred (1927).
Smith, Irwin (1932).
Smith, Joseph Neelands (1933).
Smith, Thos. Malcolm (1932).
Smuts, Cornelius Reitz (1923).
Smythe, John Francis (1900).
Solomon, Nathan (1930).
Souter, Jas. (1902).
Southern, Francis Gerald (1885).
Speedy, Isabella Hogg (1923).
Stanford, Wm. Gilbert (1933).
Stanley-Clarke, Crispian (1906).
Stephenson, Kathleen Evelyn V. (1926).
Stirling, Leader (1929).
Stoney, Robt. Thos. (1917).
Story, Bernard Samuel (1897).
Strang, Thos. Francis (1925).
Stringer, Marie Payne (1933).
Struthers, Robt. Rolf (1920).
Stuart, Annie Robertson (1924).
Studley, Thos. Chas. (1924).
Suri, Harish Chandar (1922).
Sutherland, Jane (1930).
Svensson, Robt. (1908).
Sweeney, Joseph Francis (1924).
Syson, Frederic (1925).
Sze Pon Chan (1907).

Talbot, Harry (1927).
Talent, John Wm. (1886).
Tancock, Ida Montrose (1923).
Tannahill, Wm. Bow (1905).
Tate, Arthur Littlewood (1876).
Tattersall, Kenneth Rupert (1934).
Taylor, Chas. Johnston S. O. (1929).
Thomson, Ian Cowan (1923).
Tinsdale, Geo. Fredk. Wm. (1925).
Tippett, Sydney Gordon (1894).
Tirodkar, Raghunath S. (1920).
Todd, Hy. Bansall (1887).
Tolputt, Percy Thos. (1892).
Torrance, Thos. Stirling (1923).
Townsend, Cecilia Columba (1923).
Treston, John Francis (1899).
Trotter, Dorothy Isabel (1924).
Trotter, Geo. Jas. Elliot (1886).
Tweedie, David Reid (1927).

Varadarajan, Pudukotah S. (1930).
Varley, John Francis (1928).
Verver, Bernard Thos. (1911).
Vickers, Hugh Antnony (1932).
Viljoen, Jacobus (1925).
Vincent, Samuel Anderson (1933).

Wadsworth, Guthrie Morgan (1923).
Wagle, Purushottam M. (1927).
Walker, Alfred (1896).
Walker, Thos. Warburton (1904).
Wall, Jas. Bligh (1897).
Waller, Jocelyn Langton (1914).
Walmsley, S. M. Felicia (1931).
Walsh, John Thos. (1885).
Walsh, Theodore Edwin (1925).
Walsh, Una (1921).
Walt, Maurice Lionel (1933).
Walters, St. David Gynlais (1881).
Wark, Kathleen Jane (1932).
Warrington, Wm. Oswald (1925).
Waterhouse, Arthur Reginald (1928).

Watson, Dorothy Minto (1924).
Watson, Hugh Ferguson (1907).
Watson, Ivy Rosamund (1929).
Watts, Claude Ernest (1909).
Webner, Ralph Adolph (1925).
Wedgwood, Wm. Brackenbury (1887).
Weir, Edmund Geo. Harrison (1903).
Welchman, Edwd. (1872).
Were, Mary Josephine (1913).
West, Griffith Jas. Schümm (1929).
Whitelaw, Wm. (1912).
Whitman, Vivian Emlyn (1924).
Wilkinson, Edgar Sheldon (1899).
Willett, Geo. Gilmore Drake (1881).
[illegible] (1929).
[illegible]ald (1907).
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[illegible] (1914).
[illegible]1933).
Wiseham, Beryl (1921).
Wisewould, Percy (1887).
Wolff, Gerhart (1934).
Woodfield, Thos. Harold (1893).
Worts, Stanley Edwin (1893).
Wright, Malcolm Maitland (1927).
Wright, Reginald Leslie (1919).

Young, Douglas Jerrold (1929).
Young, Jas. (1909).
Yousef. [illegible]9).
Yule, F[illegible]
Yusif, [illegible]

Zagni, Luigi (1934).

PANEL AND CONTRACT PRACTICE

Baths

The insurance committee for a county borough on the outskirts of London has decided to make representations to the town council, urging that in connexion with the extension and development of a civic centre for the borough provision should be made for the establishment of remedial, medical and Turkish baths. The committee were of the opinion that such facilities would prove a valuable addition to, and should be made available as part of, the existing local health services. The committee had previously approached the town council as to the desirability of making provision locally for the physical treatment of those suffering from rheumatic diseases, and the proposed development of the civic centre afforded an opportunity of considering the provision of such special baths. The local panel committee are being asked to give the matter their consideration and support.

Checks on Extravagant Prescribing

Remarks by a non-medical member of the London insurance committee upon the vexed question of prescribing have received widespread notice. This member alleged that insurance doctors are becoming intimidated and annoyed because in certain cases the Minister of Health sends regional medical officers to investigate their prescribing. The facts reported to the committee are that each year about 290 doctors whose prescribing averages are markedly above normal are selected and information as to special features of their prescribing, with other details, is submitted to the Minister. From these the Minister selects about one half, whose prescribing appears most likely to warrant investigation, and obtains detailed information from the committee. In about one-third of these cases the details given are sufficient to remove any presumption of extravagance. In the remainder (say about 100 cases), there has been prima-facie evidence that in some direction the cost of the practitioner's prescribing was in excess of what was reasonable, having regard to what on average was found adequate by other doctors in the county, and it has been considered desirable to seek an explanation. In such cases a visit is paid to the doctor by a member of the regional medical staff with a view to discussing those features of his prescribing which suggest that economy could be secured without sacrifice of efficiency. It is only in cases where, in the Minister's opinion, the evidence discloses reckless and serious extravagance that the case is finally referred to the panel committee. That committee, consisting as it does entirely of doctors, and almost entirely of insurance doctors, can presumably be trusted to ensure that nothing is done which would hinder or prevent a doctor from prescribing all drugs, however costly, which are reasonably necessary for the adequate treatment of his patients. But there are sometimes prescriptions which at first sight need explanation, for instance, "two ounces of Croton Oil. One drop to be taken on sugar when required." That would have sufficed an army corps.

Representations under Article 41

ARTICLE 41 of the Medical Benefit Regulations covers the procedure of the Ministry in cases when it is proposed to withhold from an insurance committee such amount as the Minister thinks fit from the money payable for the purposes of medical benefit with a view to the recovery by the committee from the practitioner or chemist concerned of a like amount by deduction from his remuneration or otherwise. Before deciding to withhold any such amount, unless the facts have already been the subject of an investigation in the course of an appeal made to the Minister, the latter must afford the practitioner or chemist a reasonable opportunity of making representations, either written or oral, on the matter; and where oral representations are made the Minister may appoint persons to hear the case and to report to him thereon. The insurance committee and the panel or pharmaceutical committee, as the case may be, are entitled to be represented at, and to take such part as the tribunal may think fit in, the hearing. An advisory committee assists the Minister in the discharge of his duties under the section. It will be observed that not only the insurance committee but the panel or pharmaceutical committee has certain rights in the case of oral representations, but the position is less clear when the doctor or chemist submits written representations in the matter.

The Cheshire insurance committee recently recommended that one pound should be withheld from a chemist, and the Minister adopted the recommendation. But in the letter conveying his decision to the chemist, a copy of which was sent by the Department to the committee, the Minister referred to certain representations made in writing by the chemist, whereupon the committee requested and obtained a copy of these representations. The committee took the view that had they been aware of certain contentions of the chemist these could have been refuted, and decided that the Minister should be requested, before making final decisions, to send a copy of any such representations to the insurance committee. The reply of the department was that the Minister regretted that in view of the intention of Article 41 of the Medical Benefit Consolidated Regulations, 1928, he could not give any general undertaking to consult the committee before coming to a decision on any case, but must exercise his judgment as to the cases in which such consultation would be proper and expedient.

Notifications of Service Subcommittee's Decisions

A provincial insurance committee has decided in future to convey the findings and recommendations in medical, pharmaceutical, and joint services subcommittee cases to the parties concerned as early as possible after the meeting of the subcommittee by which such cases are investigated, but the parties are to be advised that the recommendation is subject to adoption by the insurance committee and to possible revision by the Ministry of Health. Article 33 (4) of the Regulations provides that the relevant sub-committee shall draw up a report on each case and shall present it to the insurance committee, together with a recommendation. Usually the parties to such cases are not informed of the result until the insurance committee has come to a decision.

Dispensing Hours in London

THE London local medical and panel committee have been concerned at the alleged lack of adequate arrangements for the dispensing of prescriptions after 8 p.m. and have now come to an arrangement with the secretary of the pharmaceutical committee that when a doctor complains of a lack of adequate dispensing arrangements after that hour, the doctor shall be supplied with a list of chemists in his district where it should be possible to secure the dispensing of prescriptions after the normal hours.

PUBLIC HEALTH

Nursing in L.C.C. Hospitals

THE QUESTION OF HOURS

IMPORTANT recommendations were submitted by the hospitals and medical services committee to the L.C.C. on Tuesday, and accepted, in respect of the staffing at 12 acute general hospitals, all approved by the General Nursing Council as complete training schools for nurses. The committee recall reports of the central public health committee to the Council in July 1930 and July 1931, as to the remuneration and conditions of service of female and male nursing staffs, referring to the diversity of conditions generally, including hours of duty, at the transferred hospitals and stating that it was intended to work to a 54 hours (net) week as soon as practicable both for day and night work. On Oct. 25th, 1932, the committee reported the steps taken to reduce hours of work in excess of 56 (day), 60 or 66 (night) to those hours and to bring up to 54 a week (day or night), the hours at hospitals and institutions at which fewer were worked. It is now proposed that a 54-hour week (inclusive, in the case of probationer nurses, of two hours for lectures) should be applied in these 12 hospitals for both day and night work. The working conditions for all the twelve hospitals now dealt with are to be standardised on the following basis :—

Day staff.—Span of duty, 7.15 A.M.–8.30 P.M. (probationer nurses). 7.15 A.M.–9 P.M. (staff nurses). 7.45 A.M.–9 P.M. (sisters). Time allowance for meals, 1¾ hours (excluding supper) for probationer nurses ; 2¼ hours (including supper) for staff nurses and sister. Daily "off duty" time, 2½ hours for probationers and staff nurses, 2 hours for sisters. Day off, weekly, 1 day. Wards open to medical staff 10 A.M. Wards closed at night, 8 P.M.

Night Staff.—Span of duty, 8.45 P.M.–8.30 A.M. Relief for night meals, 1 hour. Nights off a fortnight, 4.

The numbers of staff proposed are based on the adoption of these standardised conditions. On the assumption that the ward beds will be occupied by patients of acute, semi-acute, and chronic types in normal proportions, a ward unit which provides (1) day nursing staff in the proportion of approximately one unit of staff to six patients, and (2) combined day and night nursing staff in the proportion of approximately one unit of staff to four patients (both ratios being calculated on a 90 per cent. occupation of beds, and including only staff classified as nursing staff) are considered desirable. In children's wards the combined day and night ratio should be approximately 1 to 3·5. Hospitals with a number of small wards will require more generous staffing than those with large wards. Trained nurses will always be on duty in children's wards.

Special provisions concern relief staff for "days off" and "nights off," emergency staff, and sickness and holiday relief. The numbers of staff submitted include provision for four-week courses of preliminary training at the general hospital training schools.

We welcome the reduction of hours and the precision with which the span of duty, night and day, and the times off are defined. These go some way towards fulfilling Recommendations VII to XVI of THE LANCET Commission on Nursing. The provision of 1¾ hours for meals (excluding supper) implies, we may hope, that for the midday meal more than the usual half hour is to be allowed. We note with satisfaction that the daily off-time duty, though 2½ hours instead of the three hours recommended by the THE LANCET Commission, is allocated independently of the time allowed for meals. The relief of one hour for meals during a night span of duty which is 11¾ hours is hardly liberal, but on the other hand some hospitals provide no such relief and the reduction of the night duty to 54 hours in a week brings this duty down to a level lower than that worked in most hospitals.

"WOMEN ORDERLIES"

Another proposal, to employ women orderlies in these hospitals is being received with critical attention in certain quarters. The duties of these orderlies would consist chiefly of the cleaning work at present carried out by probationer nurses during their first year of training, in the proportion of one woman orderly in each ward unit with a sister in charge. The duties would generally include :

(1) Dusting, cleaning and polishing of wards, ward equipment and fittings, making up ward fires, and filling of hot-water bottles ;

(2) Cleaning sanitary annexes, and their equipment, sorting soiled linen, scrubbing bed mackintoshes ;

(3) Assisting in preparation of meals, e.g., taking round cups and plates, bread and butter trolley, tea, dinners, &c. ; clearing away crockery, cutlery utensil, &c., after patients' meals ;

(4) In chronic and convalescent hospitals and blocks, assisting with "chronic" or "convalescent" persons requiring help on account of age (e.g., elderly people and children) in feeding, washing, blanket bathing, and taking to the bath ; also assisting in the making of beds and the combing of heads ; and

(5) Assisting the senior nursing staff if required in the blanket bathing, dressing, moving, or making of the bed of a patient when the work involves the services of two persons simultaneously. Except in circumstances as indicated in (5) women orderlies will not attend ordinarily to any patient who are ill, such patients being attended to solely by members of the nursing staff.

It seems to us that it may be unwise to allow any loophole such as would be implied by the word "ordinarily" in section 5 of the duties set out above, and that in any circumstances such duties as blanket-bathing, moving, or bed-making for the patient should be confined entirely to the nursing staff in approved training schools. The cleaning of equipment in sanitary annexes (e.g., bed pans) should also in our view be among the duties of the nursing staff which should not be delegated. Even if the probationer has ample material on which to practise nursing procedures, there is a psychological disadvantage in allowing her, at an impressionable period of her training, to regard personal service to the patient as anything but work strictly within the purview of a nurse.

Nutrition Centres in London

The report of the L.C.C. school medical officer just issued[1] contains further information about the experimental nutrition centres of which five have been started in London. At first one session a week will be held at each, the children being selected by the divisional medical officer from nominations by school doctors. The primary cases to be included are those at present under observation for nutritional defect who at the periodical inspection and weighing at school have not shown improvement. Hitherto certain children found to be undernourished have been sent to voluntary general hospitals by school care committees. They were found at the hospitals (it is stated) to have no disease and were sent away with nothing done, the suggestion being made that the school service referred to hospital very trivial conditions "which wasted the time of the hospital physicians." On the other hand, the feeling is growing among the public that local educational authorities should be doing more for the ill-nourished child, especially in the very earliest stages of malnutrition. During the experimental period the selected children are to be immediately under the observation of the L.C.C. divisional medical officer, and accordingly the centres have been located as near as possible to the divisional offices where the children will be seen by a part-time assistant medical officer with special experience in pædiatrics. To each centre will be allotted an experienced nurse and an organiser with knowledge of social economics who will investigate the family budgets and dietaries and advise the parents. This organiser will keep in touch with the school care committee; he will visit the children both at home and school, and report on conditions there. In any case where a period of observation in hospital is desired this will be arranged at one or other of the L.C.C. special hospitals for children—e.g., Queen Mary's, Carshalton, or High Wood, Brentwood.

CORRESPONDENCE

GOLD TREATMENT OF RHEUMATOID ARTHRITIS

To the Editor of THE LANCET

SIR,—At the present time much investigation is being carried out to assess the value of chrysotherapy in the treatment of arthritic conditions. That we have at last in our hands a remedy as valuable as the heavy metals in the treatment of syphilis, I have no doubt whatever. That hopeless lack of enthusiasm with which one approached the rheumatoid arthritic, aware of the impotence of all one's drugs and the majority of the other therapeutic ritual, has given place to a justifiable optimism. I know that excellent results are obtained without drugs in the hospital specially equipped for physiotherapy, with facilities for prolonged and intensive treatment, but in a general hospital I think most clinicians will agree that massage, radiant heat, baths, &c., is at best a palliative, and frequently only a placebo. Three years' experience of gold treatment in a general hospital has converted my initial strong scepticism into an ardent belief in its value.

I was stimulated to write this letter by that of Drs. Slot and Deville in THE LANCET of July 20th. I, too, have discarded the intravenous route for the gold salt in preference for the intramuscular. From the standpoint of toxicity, I do not think there is as yet anything to choose between the different preparations. To ensure safety, dosage must be small. The incidence of idiosyncrasy is unfortunately rather high, much higher than in the case, for example, of arsenic. In my own experience the genuine case of idiosyncrasy is encountered about once in thirty cases; after the initial small doses one of the toxic manifestations, usually the dermatitis, will appear, often of alarming severity. Another common time for the dermatitis to appear is after about 1 g. of the salt has been given, especially when it has not been spread over a longer period than a month. To avoid this latter difficulty, I now space the dosage over a much longer period than a month, and am always guided in the timing and size of the injections by the general condition and well-being, or otherwise, of the patient. If possible, I always see the patient personally before each injection. It is thus impossible to lay down hard and fast rules with regard to dosage, but my own usual procedure is to give 0·01, 0·05, 0·1 g. at weekly intervals, allow 2 weeks to elapse, and then give, *in cases without any reaction other than increase in local joint symptoms*, 0·2 g. at fortnightly intervals for four doses. I then repeat the course in six weeks' time.

I, too, have noted relief of pain in the osteoarthritic patient, though I have not as yet treated many. I first used gold in these cases simply for the sake of "doing something" for these unfortunate patients, without anticipating benefit, but it does seem to relieve their pain, perhaps through raising their level of health. Physiotherapy should, I think, always be employed as an adjuvant to the chrysotherapy, but not until the patient has improved *in general health* and the joints become less painful. Then encourage the full discharge of the orthopædic batteries.

I am, Sir, yours faithfully,

Liverpool, July 29th. RONALD ELLIS.

BLEEDING OF TRANSFUSION DONORS

To the Editor of THE LANCET

SIR,—I am very sorry to see that Dr. Marriott and Dr. Kekwick have taken my letters so much amiss and so little in the spirit in which they were intended. If they will re-read them, I think they will see that, so far from having "found no single good word" for either of their contributions, my comments were directed against two points only, both of them subsidiary, and on neither of which they have a right to say that I have no experience. These points were as follows:—

(1) The question of "direct approach" to veins by cutting down on them; a practice that seems to me unjustifiable except in an emergency whatever method of transfusion, drip or otherwise, is employed.

(2) The question of the degree of suction to be employed when bleeding donors. While I have never used a Dunlop foot pump for this purpose, I have in the course of the last ten years used a number of different types of pump, some of them very little less powerful than that described by the writers, and, in my experience, beyond a certain point the efficiency of the pump diminished (as might be expected when withdrawing fluid from a vessel with a highly collap-

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[1] London County Council: Annual Report of the Council. 1934. Vol. III. Part II. Public Health. London: P. S. King and Son. No. 3125. 1s. 6*d.*

sible wall), and moreover it gave rise to the unpleasant vibration described in my letter. This is not a theory, but an actual observation. The most efficient was a rubber bulb with a wall rather thicker than a Higginson syringe, with which a pint of blood could easily be obtained in the five minutes that the writers specify. As they say, it has to be seen to be believed.

So far from wishing to criticise the actual method of drip transfusion itself, I can assure them that I shall watch its developments with the greatest interest. I am, Sir, yours faithfully,

Grosvenor-street, W., July 27th. J. W. SHACKLE.

ARTIFICIAL RESPIRATION

To the Editor of THE LANCET

SIR,—At the request of the Secretary of the Medical Research Council I have investigated a new method of artificial respiration to which attention had been drawn by the inventor, Mr. Norman Pogose. The method is as follows:—

> The patient is placed in the prone position with the face turned to one side, and the operator, standing astride, first kneels on one knee and then, passing his hands under the lower part of the body, locks the fingers together, so that the palms support the patient's abdomen in the lower part. He then rhythmically lifts up and lowers this part of the body. The lift by the action of gravity drawing any water out of the air passages, while the pressure of the hands on the abdomen forces the diaphragm up and expresses air out of the lungs. When the body is lowered air is sucked into the lungs by the elastic rebound of the thorax.

The advantages of the method are first, that no injury can be done to the ribs or internal organs, as has been done by the Schäfer method when carried out with excessive force. Secondly, the method not only forces air in and out of the lungs, but blood in and out of the right heart, and this may help to set the heart going. In the case of animals I have myself observed that some blood may even be driven through the lungs and left heart and so reach the respiratory centre by means of rhythmic compression first of the abdomen and then of the thorax. The disadvantage of the method is that it is more laborious to maintain than Schäfer's, but a succession of operators could of course keep it up; if there is only one operator available he well might alternate the Schäfer method with the Pogose method, such change being, I think, to the advantage of the patient.

With the aid of respiratory valves and a gas meter, kindly placed at my use by Sir Robert Davis, at the works of Messrs. Siebe Gorman Ltd., I have investigated on a subject the efficiency of the Pogose method in comparison with that of Schäfer and Eve.

> The last method is a very efficient and easy one to carry out given the necessary apparatus, which is supplied by that firm. The patient is suitably strapped in the prone position on a light metal frame and is rocked up and down round an axis which is supported by the two legs which carry the apparatus. The weight of the viscera in the head-downward position forces up the diaphragm and expresses air out of the lungs, while air is drawn into the lungs as the body is moved into the head-upward position.

The subject of these observations while lying prone breathed naturally 11 litres a minute. By the Schäfer method lightly applied 14 litres were artificially respired; by strong application 34 litres per minute. By the Eve method there were respired 22 by slower and 36 litres by faster rate of rocking, and by the Pogose method 17 to 28 litres per minute. The Pogose method is then amply sufficient.

Mr. Pogose sets much store on adding to the treatment by artificial respiration, and, soon after its commencement, a reflex stimulation of the nervous system. He effects this by turning over the patient and sitting him up with his back supported by the operator's legs, the hands of the operator on the front of the chest, and the thumbs placed in the supraclavicular fossa. The thumbs are used to press, five or six times in quick succession, the supraclavicular nerves against the clavicles. The patient is then laid prone again and artificial respiration continued.

Mr. Pogose claims that he has found no difficulty in teaching his method to members of the police force, and that it has been used with success in resuscitating several people. There is no doubt that his method is an efficient one; in effect it resembles Eve's rocking method, but requires no apparatus.

I am, Sir, yours faithfully,

July 30th. LEONARD HILL.

A SALARIED SERVICE OF MIDWIVES

To the Editor of THE LANCET

SIR,—In your last issue (p. 219) you suggest that organised midwives would be unlikely to support a scheme for a salaried service of midwives unless it includes the compensation of midwives not accepted for the service. The report of the Joint Council of Midwifery would not have been signed by representatives of the Midwives' Institute nor would it have been endorsed by the council of the Institute unless it had clearly recommended that all midwives in practice should have an opportunity to apply for inclusion in a salaried service and should receive reasonable compensation for giving up practice if rejected, or alternatively a pension if old or infirm.

There is no readily accessible information as to the number of independent practising midwives, their average age, length of practice, working costs, &c., which could be used to base an estimate of the cost of fair compensation and pension rates, and the Midwives' Institute has sent out 6000 questionnaires to midwives in private practice, asking for those facts. These are being returned in great numbers and Dr. Janet Lane-Claypon (Lady Forber) has most generously undertaken the considerable task of tabulating the information because she realises the value of the work done by midwives now in practice.

It is difficult to understand what the London County Council means by inefficiency. Every local supervising authority has ample powers to bring up before the Central Midwives Board midwives who break the very detailed code of Rules by which their practice is restricted.

The Midwives' Institute does not believe that the ungenerous attitude of the London County Council is likely to receive much support. It is generally recognised that midwives in this country, notwithstanding the defects in their training, the very small remuneration they receive, the unregulated competition of untrained women, their omission from national insurance schemes, the fact that they have no say in the choice of the doctor they call in when their own skill fails or is insufficient, and no direct access to hospital in emergency, can show amazingly good results and an honourable record of the care of their patients.

Changes must come, but we do not believe that it will be to the interest of mothers or the public generally to effect them at the expense of depriving of their livelihood without compensation women who, even if now superfluous, have been encouraged to come forward for training either by the often uninformed cry that there was a shortage of midwives or the eagerness with which maternity hospitals have accepted their services and their premiums.

I am, Sir, yours faithfully,

G. B. CARTER,
Organising Secretary, Midwives' Institute.
Lower Belgrave-street, S.W., July 29th.

OBITUARY

WILLIAM HOWARD JONES, M.B., B.S. Lond.

SURGEON ANÆSTHETIST, CHARING CROSS HOSPITAL

We regret to record in tragic circumstances the death of Dr. Howard Jones, a well-known anæsthetist in charge of his specialty at many London hospitals.

William Howard Jones was born in 1880 and received his medical education at Owens College, Manchester, and St. Bartholomew's Hospital, qualifying with the English double diploma in 1906 and becoming M.B., B.S. Lond. in 1913. His whole professional career was devoted to the study and practice of anæsthetics, and among the anæsthetists of London, he had achieved a notable position by his activity at their various meetings, and by the force and originality with which he was wont to state the opinions which he had formed on any subject under consideration. He had played for years a prominent part at the meetings of the section of anæsthetics of the Royal Society of Medicine, and at the time of his death held the position of secretary to the Association of Anæsthetics, which post he had occupied since the inception of the Association and for the success of which the labours of Howard Jones were in no small degree responsible. Besides the post of Hon. Surgeon Anæsthetist and Lecturer on Anæsthetics to Charing Cross Hospital, he held also those of Senior Anæsthetist to the London Temperance Hospital, and Anæsthetist to the Royal Ear Hospital and to the Royal National Orthopædic and Gordon Hospitals. Howard Jones was a keen clinical worker and was the author of several papers in which he described the methods which he employed and the opinions of the practice of anæsthetics to which his experiences had led him. One of the best of these articles is that which is to be found in the proceedings of the Royal Society of Medicine for 1924. It was entitled "The use of chloroform and the misuse of ether." Although perhaps, not so pertinent to-day when the use of gaseous anæsthetics has so greatly increased, yet Jones's justification of his paper still stands, "that the great majority of operations are still performed under the influence of ether and chloroform administered by the ordinary method of inhalation." His thesis was that, as most experts admit, there are many occasions on which chloroform is the most suitable anæsthetic to employ. He proceeded to show that "chloroform may still be of the greatest value in protecting our patients from the only too common evil effects of ether." Jones was, of course, far too experienced an anæsthetist to underrate the dangers of chloroform but, himself looking at the relative merits of ether and chloroform with an unprejudiced eye, he could twit those who are less level minded. "The word chloroform seems to provoke in some people an exhibition of almost as much fanaticism as is occasionally evidenced against that poisonous but popular liquid, alcohol." A little further on he remarks, "in both we have the unostentatious user who likes to keep a little in a convenient cupboard, or in the bottle of his gas and oxygen apparatus. Both these substances are known occasionally to damage the liver yet in each instance those are to be found, who, after all, sometimes think that the risk is worth while."

It is, however, for his work on percaine, that Howard Jones's name will be long remembered, as indeed at the present time it has become well known to anæsthetists all over the world. Particularly on the continent has this work found may admirers and imitators. His initial paper on "A new regional and spinal analgesic, with special reference to high thoracic nerve root block and a new technique" was read before the section of anæsthetics in 1930. This, as well as the still fuller paper given to the British Medical Association in the following year, contains an admirable discussion of the physics, anatomy, and physiology of the endothecal method of analgesia. Not every one agrees with the views which Howard Jones expounded, but all must admire the work on which they were based, and the forcible and lucid exposition of them which he provided. Certainly they did much to clear men's minds with regard to spinal analgesia and to disprove some commonly accepted fallacies. It was always a pleasure to listen to Howard Jones, and what he said was enhanced by the appearance of the speaker. His ruddy face, bold head, gold spectacles and plump figure completed a picture which was part Pickwick and part professor, and wholly engaging. Howard Jones left a widow and two sons to whom the deep sympathy of his many professional friends will be extended.

Mr. Macleod Yearsley writes: "The wholly unexpected death of my old friend Dr. Howard Jones leaves one of those gaps which cannot be filled when one is getting older. We first met when Howard Jones was appointed anæsthetist to the Royal Ear Hospital some thirty years ago, and we have been friends ever since that time. For years past he has given practically all my anæsthetics, and my family and I have experienced his great skill and kindness as his individual patients more than once. As an anæsthetist, Howard Jones fulfilled every requisite of character and skill. However difficult the case, whatever the complications or emergencies that might arise, he met them all with the same unruffled calm. His very presence seemed to spell safety, he never failed one, he never let one down, and I believe I am right in saying that he never had a death. He carried out a good deal of research and his knowledge of anæsthetics was very comprehensive. As an individual, Howard Jones was warm-hearted and generous-minded, but always gave the impression of being a 'self-contained' man. One had to know him to appreciate all his many good points, and he possessed a fund of quiet humour that made him excellent company."

SAMUEL ERNEST PICKEN, M.B., B.Ch. Belf., M.C.

We regret to announce the death of Dr. Ernest Picken of Bristow Park, Belfast, whose accidental death by drowning occurred on Sunday, July 14th, at the age of 45. He was a son of the late Dr. James Picken of Randalstown, and received his medical education at the University of Belfast, where he graduated as M.B., B.Ch. in 1914, his clinical training being conducted at the Victoria Hospital, where he acted for a time as medical registrar. He was appointed assistant professor of materia medica at Queen's University, Belfast. He joined the R.A.M.C., was twice mentioned in despatches, and awarded the Military Cross, retiring at the conclusion of hostilities with the rank of major. He then went into practice in Belfast, and soon became well known as a practitioner. Later he undertook the duties of medical referee under the Ministry of Labour, a post which he was holding at his untimely death. Dr. Picken had many friends, and deep sympathy is extended to his widow who was with him when the tragedy occurred, during a week-end holiday.

CORNELIUS WILLIAM SUCKLING, M.D., M.R.C.P. Lond.

THE death is announced, at his house in Edgbaston on June 30th, of Dr. Cornelius Suckling who for many years held a prominent position in the medical world at Birmingham. He was a native of Birmingham, received his education at Queen's College in that city, and graduated in medicine at the University of London in 1880 with first-class honours. He proceeded to the M.D. degree in 1882, taking also the diploma of M.R.C.P. London in the following year. He was for a time medical tutor to the students of Queen's College, and was elected physician to the Queen's Hospital and professor of medicine in the College, Birmingham, one of the institutions from which later the University of Birmingham was constructed. He held other posts in the city, being physician to the Children's Hospital, and the Birmingham Orthopædic and Spinal Hospital, and after the amalgamation of Queen's College with Mason College, he was appointed professor of medicine, holding the chair at Mason College for some five years. Dr. Suckling was from the beginning of his consulting practice interested in neurological problems. He contributed to *Brain*, the *International Medical Journal*, *The Lancet*, and the *Birmingham Medical Review* papers on various neurological subjects; he wrote on migraine and epilepsy, and held views on the significance of the movable kidney which did not meet with general acceptance. He married Miss A. M. Jerome of Sutton Coldfield who survives him, but they lost both their sons. He was 81 years old at the time of his death.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Ventilation of the House of Lords

IN the House of Lords on July 24th the Marquess of LINLITHGOW moved: "That it be an instruction to the House of Lords Offices Committee to consider the provision for this Chamber of an up-to-date air conditioning plant." Attendance during three days' debate in that house induced, he said, in peers of the realm symptoms of that decay, that pallor, and that loss of condition from which by scientific devices the chilled banana, the frozen joint of beef, or the gassed apple were saved. Any one of the several British firms catering for this class of work was to-day easily capable of supplying apparatus which would enable that house to prosecute its labours in conditions both healthy and entirely comfortable, whatever the climatic conditions outside.—For the Office of Works the Earl of MUNSTER, Lord in Waiting, said that the present precautions were as follows: The air was drawn in at a low level from one of the courtyards, and, if the atmospheric conditions outside rendered it desirable, it was passed through water sprays. It then went through canvas screens with the object of eliminating excess moisture and impurities and a certain amount of fog. The vitiated air in the chamber was withdrawn by a fan in the roof. This installation was in advance of what was done in any except the most modern luxury buildings, cinemas, theatres, where conditions of occupation were more congested. A modern air conditioning plant, having regard to the nature of the building, would be very costly to install, and great care would have to be exercised on the grounds of noise, but its design presented no engineering difficulties.—The motion was by leave withdrawn.

Health and Safety in Mines

On July 24th, in committee of supply of the House of Commons, Captain CROOKSHANK, Secretary for Mines, said he would like to remove a misapprehension under which Mr. John was labouring last week when he spoke on the Home Office Vote (THE LANCET, July 27th, p. 225). Mr. John had said that he found no coöperation or coördination between the Mines Department and the Home Office. He would give two instances of such coöperation:

> The Departments were trying to coöperate to get the best dust respirator, which of course affected factories as well as mines; and to ascertain the efficiency of a method of laying dust after shot-firing. In the case of silicosis—one of the most important industrial diseases to-day—the Medical Research Council had a research committee dealing with causation and diagnosis. The Home Office came in to deal with compensation problems and the Mines Department came in with regard to prevention. On the prevention side there was to-day an official of the Mines Department who spent his whole time on the problem, which was a very difficult and exacting one. It was particularly baffling in South Wales, where it appeared to be on the increase, although there was no history of abnormal exposure to silica dust. On the silicosis side everything in the way of coöperation between the Departments concerned was really being done; both were represented on the research committee.

With regard to nystagmus, it was a relief to find a drop every year in the number of new cases. Between 1929 and 1933 the drop was no less than 40 per cent. He knew that there were fewer men employed, but not 40 per cent. fewer. Nystagmus had been considered to be due to bad lighting, and new lighting regulations were issued last year. Workers at the coal face must have lamps with a certain minimum performance. Those new lamps were started in use on Sept. 1st last, and a complete change over had to take place by the end of 1936. Last July the area in which mains lighting was permissible was extended, subject to certain safety precautions; it was disappointing that so little had been done. The third regulation with regard to whitewashing had brought great improvement.

With regard to accidents, the 265 casualties at the terrible disaster at Gresford had swollen the total number of fatal accidents. The total for the year was 1073, but if they excluded the Gresford disaster it was 808. The three-day accidents were 132,859. For the first six months of this year preliminary figures showed that there were 399 fatal accidents, a reduction of five compared with the same period last year. That represented a rate of 3·6 per million tons of output, the lowest rate they had had. Nevertheless, the risks and dangers of the mining industry were still something like six times those occurring in factories and workshops. In his last report the chief inspector of factories said:

> "The adult worker has become accustomed to his environment, and has—or ought to have—acquired habits of caution. The young entrant finds factory life an entirely new experience, and possesses, in addition, certain qualities of youth, such as bravado and curiosity, which render him essentially susceptible to accidents. It seems to me, therefore, that it is encumbent on us to give him an apprenticeship in safety just as in his productive work, and to see that he is not only warned, but forewarned, of the dangers inherent in all industrial life."

The factory inspector went on to suggest that the young entrant into industry should be shown the principal risks to be guarded against and supplied with copies of the safety rules. Steps should be taken to see that those who met with many accidents in their first year were put on some other job. In the autumn of 1931 propaganda was started with regard to boys, and that propaganda had spread tremendously. Last year there were 261 centres at which 10,647 boys attended. Certificates were given to those who were most successful, and 5500 of these boys received awards. This was admirable preventive work. With regard to safety equipment, most of the time of one divisional inspector was now devoted to work on that side. Summing up the work of his Department in regard to health and safety, Captain Crookshank said that research was being continued and inspection was being kept at the highest possible mark.

Mr. T. SMITH moved to reduce the Vote by £100. He said that the Labour Party thought that sufficient progress was not being made in reducing the accident-rate underground. He thought that so far as accidents at the coal face went, if there were less speed and less rush at the coal face there was a possibility that the figures might be reduced. They had to revise their opinions about explosions, the first defence against which was good ventilation. Too much shot-firing was taking place in the mines to-day. The Labour party had for many years been pressing successive Secretaries for Mines to bring in an Order making compulsory the use of gas detectors underground. There was to be a regulation from Oct. 1st, and while he believed that it was necessary and would be a step forward the Miners' Federation of Great Britain were not satisfied with the terms of the Order. They thought that there should be some consultation between the workmen and the management as to the type of detector to be used underground. He understood that every pit in the country was inspected once in 12 months, but that was not sufficient. With only 111 inspectors and more than 2000 pits it was obvious that the inspection could not be as adequate as it should be. There was a feeling among eminent mining men that the regulation governing stone-dusting ought to be revised. Instead of it being on a fifty-fifty basis the 50 per cent. should be the minimum. Stone-dusting was useless unless they used stone dust which would be effective. In the mining industry there was a good deal of poverty and far too many accidents. What the Labour Party could do to coöperate with anyone in reducing the accident-rate they would do. He recognised that the men took risks; they were compelled to do so. But all the accidents in the pits were not the men's fault. He (Mr. Smith) had seen some of the protective equipment and some of it was very good indeed, but the men in their poverty could not buy these appliances and so they were not extensively used. It would be a good investment for the owners to make provision for an extended use of this safety equipment.

Mr. ISAAC FOOT quoted two examples of the use of protective equipment in America:

> A coal company employing about 1600 men enforced the use of safety shoes and goggles commencing January, 1930, and these were the results: In 1929 there were 396 eye accidents and in 1932 there were 17. The days lost in respect of eye accidents in those years fell from 5839 to 13. Taking the accidents to the foot in the same mine in those years they fell from 184 to 5 and the days lost in respect of foot accidents fell from 1129 to 54; and the reduction was progressive. In another mine the equipment was not made compulsory but 95 per cent of the employees adopted the protective helmets. In 1929 there were 126 head injuries and on June 30th, 1932, they were down to 7, and the days lost in the same years had fallen from 693 to 26.

Colonial Health Services

On July 25th Mr. MALCOLM MACDONALD, Secretary of State for the Colonies, said the economic depression had led inevitably to the cutting down of expenditure on health services. Things were now a little better. One of the most effective ways of bringing these services into contact with large native populations was, he said, to enlist the help of natives who themselves were trained to take part in the medical and health services. There had been an expansion of some of those training institutions during the last 12 months.

Take the case of the old institution which had existed for some time in Ceylon. There the expansion had taken place by the recruitment of additional members to the staff, so that they could train at any given time an increased number of medical students. In the case of Nigeria, where they had not got an old-established institution, they were developing these services for training natives in medical work by expanding the medical course which was given there. They had now made arrangements in Nigeria which would enable natives to get full professional qualifications.

Mr. MacDonald added that more money was being spent on medical research into yellow fever, malaria, sleeping sickness, and other endemic diseases.

Dr. MCLEAN said that with regard to public health work, upon which little was heard until things began to go wrong, the medical officer of health seldom got credit for his preventive measures. Those who had been connected with the application of health measures knew the great difficulties that existed in getting that native coöperation which was so essential in matters like anti-malarial work. He remembered once remonstrating with a native about leaving stagnant pools of water which bred out mosquitoes carrying the disease. He replied quite simply, "If God wishes the fever to come here no Government regulations will keep it away.":

HOUSE OF COMMONS

MONDAY, JULY 29TH

Medical Testimony and Pension Claims

Mr. MABANE asked the Minister of Pensions whether he was aware that many soldiers of the Great War were now beginning to suffer from ailments, or were experiencing recurrences or after-effects of ailments or wounds sustained in the war, or were dying prematurely, and that in many cases it was not possible to establish an incontrovertible medical history to relate present ailments or premature death to war service; that there was a widespread sentiment throughout the country that the pledge given during the war that no soldier should fail to receive full compensation for any injury he sustained should be most generously interpreted; whether he would, therefore, consider appointing non-medical bodies of ordinary citizens, similarly constituted to common juries, to decide upon cases where there was conflict of medical testimony; and whether he would be prepared to accept the decision of such bodies as final.—Mr. R. S. HUDSON replied: I am glad to be able to assure the hon. Member that the late claims now being received, which are diminishing in number, are not determined on evidence amounting to legal proof or the absence of it, as he would appear to imagine. On the contrary, each case is decided on its merits in the light of all the evidence available, and frequently after consultation with outside specialists of eminence. I am afraid I do not consider the suggestion in the last part of the question either necessary or practicable.

Sir JOHN WALLACE: Is due weight attached to independent medical testimony which may be in conflict with the official testimony; and is my hon. friend aware that in spite of his reply very serious cases of grievance are arising all over the country on account of the lack of consideration extended to the cases referred to?

Mr. HUDSON: As the hon. member knows there is a procedure in operation by which where there is any serious difficulty the case is submitted for the advice of an eminent outside professional expert nominated by the president of the Royal College of Physicians or the president of the Royal College of Surgeons as the case might be. I think I am correct in saying that in no case has the advice of that independent expert been disregarded. In every case his advice has been taken by my Department.

Water Supply in Rural Areas

Colonel ROPNER asked the Minister of Health whether he had received any recent notification of shortage of water in rural districts; and what action he was taking.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Pensions, replied: My right hon. friend has not received any recent notification of serious shortage except in a few rural areas. In all cases brought to his notice an engineering inspector visits the locality with a view to expediting the preparation and carrying out of permanent scheme. In rural areas generally good gress is being made, and so far grant has been provi- nally allocated in respect of schemes for 1360 parishes a total estimated capital cost of £3,900,000.

Poisons Board and Teaching of Chemistry

Ir. **Henderson Stewart** asked the Home Secretary e had considered the protest of St. Andrew's University inst the recent proposals submitted by the Poisons ard; and if he could give the assurance that no attempt uld be made, by vesting powers in an outside institu- n, to infringe the independence of the university as gards the teaching of chemistry.—Captain **Wallace**, nder-Secretary, Home Office, replied: My right hon. end will give the fullest consideration to the repre- tations of St. Andrew's University in conjunction th the other representations which he has received. m not in a position at the moment to make any further tement in the matter, since the statutory period for aking representations in regard to these rules only pired yesterday.

Children's Branch at Home Office

Mr. **Rhys Davies** asked the Home Secretary when it as intended to issue the next report covering the work the Children's Branch.—Captain **Wallace** replied: he staff of the Children's Branch has been so much cupied with the administration of the new Children nd Young Persons Act and other matters that it has not een found possible to review its work in another report. y right hon. friend recognises the usefulness of these ports and hopes to have one issued as soon as circum- tances permit.

Sickness in the Public Service

Mr. **Herbert Williams** asked the Secretary to the reasury if he could furnish any comparative statistics s to the respective sick absences of males and females n the public service.—Mr. **Duff Cooper**, Financial ecretary to the Treasury, replied: Statistics relating o the sick absences of some 50,000 established non- ndustrial civil servants in certain large departments, ther than the post office, indicate that the average umber of days sick leave per annum taken by men and omen during the years 1932, 1933, and 1934 were as ollows:—

Men (disabled)	11·8
,, (others)	8·6
Women	12·9

Corresponding figures for the post office, relating to bout 160,000 established persons, are:—

Men (disabled)	15·1
,, (others)	10·7
Women	12·2

Air Raid Circular to Local Authorities

Mr. **Temple Morris** asked the Home Secretary the nature of the replies received from local authorities to the recent air-raid circular; and whether he had received any refusals to take action under it.—Captain **Wallace** replied: The purpose of the circular was to convey information to local authorities, and no reply was called for. Local authorities are presumably waiting for the conferences referred to in the circular, which will be held after the holidays. No refusals to take action under the circular have been received.

WEDNESDAY, JULY 24TH

Children and Gas Mask Drill

Mr. **Morgan Jones** asked the President of the Board of Education whether any plans had been made for the training of school-children in gas-mask drill, or whether such plans were contemplated.—Mr. **Ramsbotham**, Parliamentary Secretary to the Board of Education, replied: No, Sir.

Precautions against Air Attacks

Mr. **Harcourt Johnstone** asked the Prime Minister whether instructions for compulsory "black-outs" in districts where experiments were being carried out against air attacks were issued by authority of any Government department; and, if so, by what authority such orders were given.—Mr. **Baldwin** replied: No instructions for compulsory "black-outs" have been issued or are in contemplation. These experiments, like all other air-raid precautions services, are being carried out with the voluntary coöperation of all concerned.

Mr. **Dobbie** asked the Home Secretary what plans, if any, had been made to prevent the sale of worthless, inefficient, and dangerous gas masks to the general public; if he proposed to institute financial control over such firms in order to prevent profiteering; further, if he intended to examine such products systematically in order to ensure that inefficient appliances were not sold to the general public; and if he would take steps to ensure that the durability and reliability of all gas masks, both in use and in storage, was clearly indicated on the mask when it was sold.—Captain **Wallace**, Under-Secretary, Home Office, replied: The Government are fully alive to the importance of protecting the public against the sale of respirators of inferior capabilities, and are actively investigating the most suitable means of achieving this object. Special consideration is being given to the question of inspection.

Mr. **Logan** asked the Home Secretary what quantities of bleaching powder, which could be used as a decontaminating agent against poison gas, were available; how long such reagent could be stored without deterioration; and if he proposes to recommend its use to local authorities.—Captain **Wallace** replied: Bleaching powder is an ordinary commercial product, but particulars of the available stocks cannot be stated. Its deterioration is largely a question of methods of packing and storage. Information to local authorities as to its use for decontamination purposes will be included in publications now in course of preparation.

THURSDAY, JULY 25TH

Food Value of Herrings

Mr. **Chorlton** asked the President of the Board of Education whether, as the food value of herrings was so high and the quantity available so great, he would make arrangements to supply schools in a similar manner to that which was used for milk at the present time.—Mr. **Oliver Stanley** replied: I am afraid it would prove impracticable to distribute herrings in schools in the manner suggested by my hon. friend. In view of the high food value of herrings, however, I should welcome their increased use as part of the midday meals supplied at feeding centres and school canteens.

TUESDAY, JULY 30TH

New Military Hospital at Edinburgh

Mr. **Guy** asked the Financial Secretary to the War Office what progress had been made in the negotiations between the War Office and the Edinburgh corporation for the purchase of land at Redford for a military hospital and new artillery barracks.—Mr. **Douglas Hacking** replied: No final decision has yet been reached, but it is hoped that the scheme will be completed within the next few weeks.

Mines Inspectors at Coroners' Inquests

Mr. **Tinker** asked the Secretary for Mines how many coroners' inquests were attended by His Majesty's inspectors of mines during 1934; and the highest number attended by one inspector.—Captain **Crookshank** replied: The number of coroners' inquests attended by H.M. Inspectors of Mines in 1934 was 854; in addition they attended 140 fatal accident inquiries in Scotland, where there is no coroner's inquest. The highest number attended by one inspector was 44.

Welfare Work in Mining Areas

Miss **Ward** asked the Secretary for Mines whether he would consider instituting an inquiry into the adequacy of the welfare work carried on throughout the mining areas.—Captain **Crookshank**: I would remind my hon. friend that the whole question of miners' welfare work was fully investigated by the Departmental Committee under the chairmanship of Lord Chelmsford in 1932, and there is clearly no justification for another such inquiry. I understand, however, that following upon the extension of the period of the Miners' Welfare Levy by the Mining Industry (Welfare Fund) Act of last year, the Miners' Welfare Committee is approaching the various District Committees with a view to having separate surveys made of the welfare facilities available in each district. I may add that a welfare organiser has recently been appointed for Northumberland who will commence a survey of that district shortly.

MEDICAL NEWS

University of Oxford

Dr. A. M. Cooke, has been re-elected to the May fellowship and readership for a further period of three years.

University of London

On July 17th the degree of Ph.D. was conferred on Dr. S. S. Bhatnagar, and Dr. C. E. Dolman.

At recent examinations T. F. Todd was successful in passing branch I (surgery) of the M.S. degree.

University of Manchester

Dr. James Davson has been appointed demonstrator in pathology.

Royal College of Physicians of London

At the quarterly meeting of the college on July 25th, with Lord Dawson, the president, in the chair, the following fellows were elected officers for the ensuing year:—

Censors: Sir Arthur J. Hall, Dr. Gordon M. Holmes, F.R.S., Dr. H. Letheby Tidy, and Dr. C. E. Lakin. Treasurer: Dr. Sidney P. Phillips. Registrar: Sir Raymond Crawfurd. Harveian Librarian: Dr. Arnold Chaplin. Assistant Registrar: Dr. Charles Newman. Library Committee: Dr. H. R. Spencer, Dr. J. J. Conybeare, Dr. A. E. Clark-Kennedy, and Dr. Reginald Hilton. Curators of the Museum: Dr. G. E. Beaumont, Dr. Maurice Davidson, Dr. R. A. Hickling, and Dr. Daniel Davies. Finance Committee: Dr. T. Watts Eden, Dr. C. R. Box, and Prof. F. S. Langmead.

The following were elected examiners:—

Chemistry: Mr. Herbert Lambourne and Mr. C. S. Gibson. Physics: Mr. W. H. White and Mr. Gilbert Stead. Materia Medica and Pharmacology: Dr. Philip Hamill, Dr. R. St. A. Heathcote, Dr. Clifford Hoyle, Dr. E. Gordon Holmes, and Prof. W. J. Dilling. Physiology: Prof. C. A. Lovatt Evans, F.R.S., and Prof. D. T. Harris. Anatomy: Dr. Thomas Yeates. Pathology: Dr. C. M. Wilson, Dr. C. Terence East, Prof. Geoffrey Hadfield, and Dr. P. N. Panton. Medical Anatomy and Principles and Practice of Medicine: Dr. Otto Leyton, Dr. C. M. Hinds Howell, Dr. A. G. Gibson, Dr. H. C. Cameron, Prof. A. E. Naish, Sir Stanley Woodwark, Dr. Anthony Feiling, Dr. G. E. S. Ward, Prof. W. H. Wynn, Dr. J. W. McNee, Dr. J. Forest Smith, and Dr. T. Jenner Hoskin. Midwifery and Diseases peculiar to Women: Prof. Gilbert Strachan, Mr. J. M. Wyatt, Mr. A. J. McNair, Mr. Leslie Williams, and Prof. R. P. Ranken Lyle. Public Health: Part I., Prof. M. E. Delafield, and Part II., Dr. C. T. Maitland. Tropical Medicine: Prof. J. Gordon Thomson and Lieut.-Colonel G. S. Parkinson. Ophthalmic Medicine and Surgery: Dr. F. M. R. Walshe. Psychological Medicine: Part I., Dr. R. D. Gillespie; Part II., Dr. Douglas McAlpine, and Dr. A. A. W. Petrie. Gynæcology and Obstetrics: Mr. J. P. Hedley. Laryngology and Otology: Mr. V. E. Negus. Radiology: Mr. J. H. Brinkworth and Dr. H. K. Graham-Hodgson. Anæsthetics: Dr. C. W. Morris. Child Health: Dr. Leonard G. Parsons. Murchison Scholarship (1936): Dr. H. Gardiner-Hill and Dr. C. F. Harris.

Lord Dawson was re-elected the representative of the college on the governing body of the British Post-graduate Medical School.

The president announced the award of the Baly medal to Mr. F. H. A. Marshall, Sc.D., F.R.S., as a pioneer in the experimental investigation of sexual physiology and the relation of hormones to it; and the award of the Bisset Hawkins medal to Sir George Newman for his distinguished services to public health and for the leading part played by him in the institution of social medical services.

The following appointments were announced:—

Sir Walter Langdon-Brown as Harveian orator, 1936 (the forthcoming Harveian Oration in October next will be delivered by Sir Henry Dale, F.R.S.); Dr. Edward Mapother as Bradshaw lecturer, 1936; Dr. E. L. Middleton as Milroy lecturer, 1936; Dr. R. A. McCance as Goulstonian lecturer, 1936; Dr. John Parkinson as Lumleian lecturer, 1936; Mr. Joseph Needham, Sc.D., as Oliver-Sharpey lecturer, 1936; Dr. J. D. Rolleston as FitzPatrick lecturer, 1936; Dr. R. R. Trail as Mitchell lecturer, 1936; and Dr. Edwin Bramwell as Croonian lecturer, 1937.

The Murchison scholarship was awarded to Dr. W. M. Wilson. Leverhulme scholarships were awarded to Dr. R. L. Noble and Dr. C. C. Ungley; a grant from the same fund was made to Dr. Janet Vaughan to continue the work on which she was engaged before relinquishing her scholarship; and Dr. E. G. L. Bywaters and Dr. L. C. Bousfield were reappointed for six months as Mackenzie Mackinnon scholars.

The following candidates satisfied the Censors' Board and were admitted members of the college:—

Herbert Ernest Appleyard, M.D. Univ. W. Ont.; Alexander Howard Barber, M.B. Birm.; Robert Freeland Barbour, M.B. Edin.; Alfred Ernest Barclay, M.D. Camb.; Cyril George Barnes, M.D. Lond.; William Alexander Caldwell, L.R.C.P. Lond., D.P.M.; Ram Nath Chopra, C.I.E., M.D. Camb. (in absentia); John Francis Coates, M.D. Brist.; Charles Crookenden Cobb, M.B. Oxon.; Hugh Wolfe Corner, M.D. Aberd.; Joseph Edward Debono, M.D. Malta; Maurice Edmund Disney, M.B. Lond.; Guy Arthur Emmerson, M.B. Camb.; Charles Edmund Garson, M.B. Madras; Prashanta Kumar Ghosh, M.B. Calcutta; Vishnu Ramchandra Ginde, M.B. Bombay; Sayed Ahmad Hasan, M.B. Punjab; Mostafa Hashem, M.B. Cairo; Mark Ian Alastair Hunter, L.R.C.P. Lond.; Basappa Sangapa Jirge, M.B. Bombay; Jonas Henrick Kellgren, M.B. Lond.; Michael John Francis McArdle, M.B. Lond.; Thomas Christopher Maling, M.B. Camb.; Malcolm William Miller, M.B. Adelaide; Wilfrid Davison Newcomb, M.D. Camb.; David Neill Parfitt, M.D. Lond.; Arthur Spencer Paterson, M.D. Edin.; Hubert Edward Spencer Pearson, M.B. Lond.; Sydney Augustine Propert, B.Chir. Camb.; Kenneth Robson, M.B. Camb.; Susanta Kumar Sen, M.B. Camb.; Mangaldas Jagjivandas Shah, M.B. Bombay; Edward Peter Sharpey-Schafer, L.R.C.P. Lond.; Patrick McIlroy Smyth, M.B. Camb.; Alan Carruth Stevenson, M.B. Glasg.; Magnus Louttit Thomson, M.B. Aberd.; Henry Arthur Treble, M.B. Oxon.; Ralph Whishaw, M.B. Sydney; Arthur Willcox, M.B. Camb.; Mervyn Williams, L.R.C.P. Lond.; Ralph Paul Williams, M.D. Lond.; Mary Juliet Wilmers, M.B. Lond.; John Caspar Winteler, M.B. Lond., L.R.C.P.; and George Payling Wright, M.D. Oxon.

Licences to practise were conferred upon 205 candidates (183 men and 22 women) who have passed the final examination of the Conjoint Board and have complied with the college by-laws. The following are the names and the medical schools of the successful candidates:—

H. L. Ackerman, Lond.; S. N. Ahmed, Osmania and Birm.;
S. G. Alavoine, Lond.; H. F. Ande
S. O. Aylett, King's Coll.; P. H.
H. D. G. Barnes, Lond.; Mary J.
Beggs, Middlesex; Dipak Bhati
K. O. Black, Camb. and St. Ba
F. L. Bland, Birm.; A. C. Blandy,
M. Blenkin, Roy. Free N. H. Bl
A. S. Bookless, Camb. and Guy's; Fenton Braithwaite,
and St. Bart.'s; W. G. Brander, Camb. and St. Thos.; Margaret C. Briggs, Roy. Free; Margaret Brodigan, Univ. Coll.; A. J. Broomhall, Lond.; E. A. E. A. Brown, St. Mary's; J. L. Brown, Liverp.; K. P. Brown and L. H. Buckland, St. Bart.'s; Kathleen E. Burnell, Roy. Free; E. W. Burstal, St. Bart.'s; H. A. Burt, Camb. and Univ. Coll.; J. H. Caverhill, St. Thos.; H. G. Cereseto, St. Bart.'s; John Charnley, Manch.; P. W. Clarkson, Guy's; J. G. Clothier, King's Coll.; J. H. Cobb, Univ. Coll.; Benjamin Cohen, Charing Cross; G. H. Collier, Manch.; C. D. Coode, Oxon. and Lond.; A. H. Cooke, St. Bart.'s; J. T. Corbett, Birm.; R. F. Courtin, St. Thos.; David Craig, St. Bart.'s; J. M. Cribb, Oxon. and Cardiff; G. F. Crickmay, St. Thos.; Annys M. Cusack, Univ. Coll.; Gilbert, Dalley, St. Bart.'s; V. R. Damle, Bombay; D. V. Davies, Univ. Coll.; D. W. Davies, Cardiff and Middlesex; R. D. L. Davies, Middlesex; W. J. F. Davies, Cardiff; A. B. Dempsey, Lond.; Thomas Denness, St. Thos.; W. H. H. J. De W. De Wytt, Dubl.; L. D. P. Dharmaratne and C. W. Dixon, King's Coll.; R. C. Dolly, St. Bart.'s; E. W. Dorrell, Camb. and St. Bart.'s; J. F. Dow, Camb. and Middlesex; Jean Duncan Whyte, Roy. Free; L. S. Dymond, Cardiff; K. G. Eckersley, Leeds; J. E. Elliott, Guy's; G. D. Elphick, Camb. and St. George's; Maurice Epstein, St. Bart.'s; N. P. Eskell, Camb. and Brist.; E. W. R. Fairley, St. Thos.; Dora J. B. Falconer, Roy. Free; I. A. Feldman, Leeds; Annie Fidler, Manch.; J. G. Field, Brist.; E. L. Fisher, St. Bart.'s; C. S. Ford, Middlesex; I. M. Fradkin, Lond.; O. P. Frank, St. George's; J. H. Mayer Frohlich, Middlesex; J. G. Garman, Birm.; J. St. Garnett, Manch. and Lond.; K. D. Gibson, Camb. and St. George's; B. M. Goldsworthy, St. Thos.; J. F. Goodall, Leeds; C. N. Gosse, Camb. and St. Mary's; D. R. Gray, Camb. and Brist.; Gladys J. Greenhalgh, Roy. Free; C. U. Gregson, Camb. and Liverp.; G. S. C. De S. Gunasekera, Ceylon and West Lond.; Irene G. Hamilton, Brist.; D. R. Hanbury, Middlesex; D. T. K. Harris, St. George's; M. J. Harris, Guy's; W. N. L. Haynes, St. Thos.; Sylvia A. M. Herford, Roy. Free; N. J. P. Hewlings, Camb. and St. Bart.'s; C. C. Houghton, Birm.; D. M. Hughes, Cardiff; T. P. E. Hughes, Oxon. and Middlesex; C. S. Humphries, Camb. and St. Thos.; H. B. Hunt, Birm.; M. I. Husain Osmania and Lond.; N. W. Irish, Guy's; E. C. O. Jewesbury, Oxon. and St. Bart.'s; H. D. Johnson, Camb. and St. Thos.; S. J. Johnson, Univ. Coll.;

S. A. Jones and H. S. Joseph, St. Bart.'s; Solomon Kaufman, Univ. Coll.; A. R. Kelsall, Camb. and St. Bart.'s; T. B. Kenderdine, Birm.; A. R. Kennedy, St. Bart.'s; A. S. Kerr, Liverp.; A. A. Khan, Hyderabad and Lond.; F. J. D. Knights, Middlesex; M. J. Lange, Guy's; R. B. Leech, Camb. and Lond.; P. H. Lenton, Camb. and Middlesex; M. J. Levi, Leeds; Harry Levitt, Charing Cross; J. L. Lewis, Lond.; P. T. Liem, Hong Kong and St. Thos.; C. A. Lillicrap, Guy's; W. L. Lister, St. Mary's; Oswald Lloyd, Middlesex; O. G. Lloyd, Univ. Coll.; J. F. Loutit, Melb. and Lond.; A. C. Maguire, Charing Cross; J. I. C. Mason, St. Bart.'s; D. N. atthews, Camb. and Charing Cross; W. d'A. Maycock, cGill; Ellen Mayer, King's Coll.; W. R. Merrington, Univ. oll.; Samuel Meyers, King's Coll.; I. H. Milner, Charing oss;; C. R. Morison, Camb. and St. Bart.'s; L. F. Muldavin, . Mary's; N. W. N. Murray, King's Coll.; W. G. Murray-owne, Camb. and St. Thos.; M. L. Nairac, St. Bart.'s; B. Neal, Westminster; Howard Nicholson, Univ. Coll.; . P. Niyogi, Calcutta and West Lond.; A. J. Owston, Camb. nd St. Bart.'s; J. G. Parekh, Bombay and St. George's; aude A. Parfitt, Univ. Coll.; W. D. Park, St. Bart.'s; J. N. arker, Manch.; D. N. Parry, St. Thos.; P. S. Patuck, Univ. oll.; Mary M. Paulosky, West Lond.; G. E. Paxon, Guy's; . W. V. Pegge, Camb. and St. Mary's; A. D. Petro, Camb. nd St. George's; E. H. D. Phillips, Camb. and St. Bart.'s; . M. G. Pole, St. Bart.'s; A. R. Pope, Camb. and St. Bart.'s; . J. Porter, Camb. and Lond.; I. H. Premdas, St. Bart.'s; . S. Price, Birm.; W. A. Pritchard, Univ. Coll.; D. A. Pro- hero, St. Bart.'s; S. A. Qadri, Osmania and Birm.; B. K. R. ao, Mysore and Lond.; R. G. Record, Birm.; S. J. R. Rey- olds, Camb. and Charing Cross; E. A. Richards, St. Thos.; . E. O. Ringdahl, St. Bart.'s; Bernard Roberts, St. Mary's; ilda Roberts, Liverp. and West Lond.; R. E. Rodgers, Camb. nd St. Thos.; P. W. D. Russell, St. Thos.; J. P. Salkield, niv. Coll.; R. G. Samuel and R. S. Saxton, Camb. and St. Bart.'s; Moses Schlaff, St. Bart.'s and West London; James chofield, St. George's; P. G. Scott, Camb. and Univ. Coll.; Coleman Segalov, King's Coll.; Girija Nath Sen, Calcutta and t. Bart.'s; H. J. Sherren, Camb. and St. Thos.; S. G. Shippard, King's Coll.; N. S. Shtetinin, Manch.; Aubrey Smiter, St. Mary's; G. C. Smith, St. George's; Elsie M. Smyth, Univ. Coll.; S. J. Stein, King's Coll.; Eunice F. Sterling, Rochester nd Roy. Free; J. M. Stewart, St. Bart.'s; Abraham Stoller, Univ. Coll.; D. W. I. Thomas, St. George's; H. C. Thomas, Lond.; S. M. Thompson, Camb. and Leeds; J. D. B. Vaile, St. Thos.; W. H. Valentine, Camb. and St. George's; Constance M. Vallange, West Lond.; P. W. Vilain and Alan Wardale, King's Coll.; Melville Watkins, St. Mary's; Elizabeth H. Western, Camb. and King's Coll.; B. L. Williams, Camb. and St. Thos.; Eugénie L. Willis, Camb. and Roy. Free; A. B. Wilson, Manch.; J. S. H. Wilson, St. Bart.'s; G. N. M. Wishart, Manch.; Rowena Woolf, Roy. Free; G. F. Wright, Camb. and St. Thos.; and Hyman Yarrow, St. Bart.'s.

Royal College of Surgeons of England

An ordinary meeting of the Council was held on July 25th, with Sir Cuthbert Wallace, the president, in the chair. Mr. Thomas William Widdowson was elected a member of the board of examiners in dental surgery. Prof. G. A. Buckmaster and Mr. Gordon-Taylor were appointed examiners for the forthcoming primary examination in India for the fellowship. The president stated that, after the primary fellowship examination, which will be held at the end of this year, the next examination in India will not take place until 1937.

The following hospitals were approved with the posts specified for recognition for the six months' surgical practice required of candidates for the final examination for the fellowship:—

London.—The West London Hospital (3 house surgeons); Woolwich and District War Memorial Hospital (for two years, senior resident medical officer and one house surgeon).

Provinces.—Radcliffe Infirmary, Oxford (resident surgical officer and one house surgeon; Cornelia and East Dorset Hospital, Poole (for two years—one house surgeon); Swansea General and Eye Hospital (senior resident medical officer and 3 house surgeons).

Diplomas in anæsthetics were granted to the following under the special conditions of the regulations, jointly with the Royal College of Physicians:—

H. E. G. Boyle, Robert Brown, J. M. Clark, F. T. Evans, C. F. Hadfield, Frederick Whalley.

The following diplomas were also granted jointly with the Royal College of Physicians:—

D.O.M.—K. B. Armstrong, F. G. Fenton, N. W. Gardener, P. K. Guha, M. A. L. Hassouna, T. H. Hodgson, R. H. Hucknall, G. A. Jamieson, Hermann Lipschütz, M. C. Mankodi, J. R. Mutch, Samuel Pearlman, Violet M. Phelps, H. L. Shankman, S. K. Sledge, A. McL. Thomson, T. H. S. Tizzard, and S. D. H. D. Wallis.

D.M.R.E.—Christine C. Abernethy, D. Hugo, and D. J. Thomas.

Diplomas of membership were granted to the candidates named in the report of the meeting of the Royal College of Physicians.

Diplomas were also conferred jointly with the Royal College of Surgeons on those candidates named in our issue of June 22nd, p. 1476, July 20th, p. 167, and in this issue under the Royal College of Surgeons.

Dr. Barugh Spearman, chief medical and health officer for Grenada, has been appointed a member of the Executive Council of the island.

University College Hospital Medical School

The Bilton Pollard fellowship has been awarded to Dr. J. C. Hawksley.

Epsom College

St. Anne's Scholarship.—The council will shortly elect a girl to a St. Anne's Scholarship of £110 a year, tenable at an approved boarding school. Candidates must be not less than nine years of age on July 30th, 1935, and must be orphan daughters of medical men, who, for not less than five years have been in independent practice in England or Wales. Application must be made by Oct. 22nd on a form to be obtained from the secretary of the College, 49, Bedford Square, London, W.C. 1.

Middlesex Hospital Medical School

On July 24th this hospital celebrated the hundredth anniversary of the foundation of its medical school. In the afternoon the Earl of Athlone, chancellor of the University of London, visited the hospital to present the prizes to the students and nurses. Prince Arthur of Connaught presided and among those present were Lord Dawson, P.R.C.P., Sir Cuthbert Wallace, P.R.C.S., and Dr. J. S. Fairbairn, P.C.O.G. Mr. A. E. Webb-Johnson, treasurer of the medical school, speaking on the "First Hundred Years," described the steady progress which had taken place in the science and practice of medicine during this time; thousands who had watched the Jubilee procession would not have lived to see it but for the application of newly acquired medical knowledge. He reminded his listeners of the alliance of the medical school with the University of London, and of the many benefactors who had helped it in recent years—including Bland Sutton, the Joels, John Astor, and S. A. Courtauld. Lord Dawson and Sir Cuthbert Wallace congratulated the school on behalf of the Royal Colleges. Dr. H. E. A. Boldero, the dean of the medical school, announced that two scholarships of £100 each were being founded by the council for London University men who had done their preclinical work. Mr. E. W. Meyerstein had given £3000 to endow one of these scholarships, and had also given the school £20,000 to add to the accommodation available for students.

In the evening Prince Arthur of Connaught and Mr. Courtauld received a large company in the board-room of the school. A display of scientific exhibits had been prepared in the different rooms and in the first section, devoted primarily to radiotherapy, there were "electromagnetic surprises," "radium luminosities," an instrument which tracks down missing radium, and a model of the projected radiotherapy department. In another section apparatus for artificial respiration attracted much attention, and there were also demonstrations of the electric currents produced by heart-beats and of methods used in the examination of foods, drugs, stimulants and soaps, historical exhibits were arranged in the dean's room, and engravings and photographs in the senior common room. Prof. Samson Wright also gave several exhibitions of a cinematograph film of the circulation of the blood, while the temperature of the ordinary air intensified the audience's appreciation of Prof. W. B. Tuck's demonstration of the freezing properties of liquid air. (Incidentally, his frozen whisky had so much success that only the licensing laws, he averred, prevented him from promoting a new line of the stop-me-and-buy-one business.) In the museum upstairs microbes were treated with thoughtful concern, one of the tables being reserved for "delicacies to tickle the bacterial palate." Other exhibits in the same section included blood pictures in disease and blood tests in infection and fevers. Elsewhere the visitors were shown examples of the use of biochemical analysis and tests in medicine, the observation of cell metabolism, and the determination and application of the basal metabolic rate. A fifth section displayed the equipment of the X ray diagnostic department, which is said to be capable of handling 30,000 to 40,000 cases per annum. It includes an X ray pathological museum with ten sections of viewing-boxes, each devoted to a particular part of the body.

Royal Dental Hospital

The prize distribution and conversazione of the Royal Dental Hospital and London School of Dental Surgery, will be held at the hospital (32, Leicester-square W.C.), on Friday, Oct. 4th, at 8 P.M. when Sir Francis Dyke Acland, will preside.

London Hospital Medical College

The post-graduate course for former students of this school will be held from Oct. 16th to 19th. Further particulars may be obtained from Dr. A. E. Clark-Kennedy, the sub-dean, the London Hospital E.1. The annual, dinner for all past students of the hospital will take place at the Trocadero Restaurant, Shaftesbury-avenue, W., on Thursday, Oct. 17th, at 7.30 P.M.

University of Hong Kong

Mr. W. C. W. Nixon, F.R.C.S, assistant obstetrical surgeon with charge of out-patients at St. Mary's Hospital, London, has been appointed professor of obstetrics and gynæcology in the University, and consultant to the Government Civil Hospital, Hong Kong.

Royal Society of Medicine

The William Gibson research scholarship for medical women has been awarded to Dr. F. Stephen-Lewis of the University of Witwatersand. Dr. Stephen-Lewis proposes to carry out a reseerch on the chenistry of South Africann plants, and particularly those used by the natives as medicines. She will also investigate physiological data for the various native tribes.

International Union against Tuberculosis

Delegates from twenty countries attended a council meeting of the union at 66, Boulevard St. Michel, Paris, on July 10th and 11th, under the chairmanship of Dr. Piestrzynski, under-secretary of state for Poland. The administrative meeting was devoted to the preparation of the programme of the Lisbon conference on Sept. 8th–10th, 1936, when the principal subjects of discussion will be "Radiological aspects of the pulmonary hilum and their interpretation" (to be opened by Prof. Lopo de Carvalho, Portugal); "Primary tuberculous infection in the adolescent and the adult" (Dr. Olaf Scheel, Norway); "The open case of tuberculosis in relation to family and domestic associates" (Sir Henry Gauvain, Great Britain). At the scientific meeting Prof. Lyle Cummins (Cardiff) occupied the chair, and Prof, Madsen (Copenhagen), submitted a report on "Tuberculin Standardisation and Tuberculin tests." Dr. Kendall Emerson, managing director of the National Tuberculosis Association, gave an account of the work of Dr. Long and his collaborators, who claim to have isolated the active principle of tuberculin. The relative merits of Pirquet's cuti-reaction and Mantoux's intradermal test were considered; the majority of the French speakers expressed a preference for the former, while their colleagues from other countries preferred Mantoux's test. They all agreed on the advisability of adopting a standard tuberculin and a uniform tuberculin test.

La Semaine Medicale Internationale

An international medical week has been organised by the Schweizerische Medizinische Wochenschrift at Montreux from the 9th to the 14th September under the control of a distinguished Swiss committee. The programme opens with a reception on the evening of Sunday, Sept. 8th, in the Montreux Casino. Important discussions on general subjects have been promised for the ensuing days, and such authorities as Sir Henry Dale and Profs. Abderhalden, Sigerist, de Quervain, Sanarelli, and Lemierre, will take part in them on Monday, Tuesday, and Wednesday. On Thursday debates on neuroses and failures of growth in children will be followed by a visit to the Nestlé factory. On Friday the treatment of cancer will be discussed from many angles, special attention being paid to radiotherapy. The sittings will take place in the mornings in the Montreux Palais, and receptions are planned at which ladies accompanying the congressists will be welcomed, a special ladies' committee having been instituted. Further information can be obtained from the Sekretariat der Internationalen Medizinischen Woche in der Schweiz, Klosterberg 27, Basel.

Advisory Committee on Nutrition

The Minister of Health and the Secretary of State for Scotland have appointed Dr. T. W. Wade, of the Welsh Board of Health, and Mr. E. H. H. Lloyd, secretary of the Market Supply Committee, to be members of the new Advisory Committee on Nutrition. The constitution of the committee was announced in our issue of June 8th (p. 1364).

Medical Charitable Society for the West Riding

The annual meeting of this society was held at Huddersfield on June 30th, Dr. D. L. Cairns presiding. Forty-four applications came before the meeting and, all being found deserving, grants were made amounting to £2,283. To mark the occasion of the King's Silver Jubilee a gift was made to each recipient of 10 per cent. of the amount of the grant allotted. Of the recipients, nine had already been given twenty or more grants, three had been given thirty or more grants, and one applicant had received no fewer than 53 grants. One of the annual subscribers died in the year 1883; in respect of his membership the first application was made by one of his sons just fifty years after, and was at once met by an emergency grant and by an ordinary grant at the next annual meeting. Since the inception of the society grants have been made amounting to £95,726 and £49,670 expended in the purchase of securities. A grant of £50 was made to Epsom College; under the new rules, money can now be voted by the society for foundation scholarships at the College. The objects of the society are to help any of its members who are disabled by illness, accident or age and who have not adequate means of support; to help the widow or children of a deceased member, who may at any time require assistance; under certain restrictions, to extend help to the relatives of a deceased member who may have acted as his housekeeper, and finally to contribute to the expenses of the education of children of members or of deceased members in cases where it is deemed advisable to do so.

Appointments

Marshall, S. F., M.B., M.R.C.P. Lond., has been appointed Pathologist to St. Mary's Hospital for Women and Children, *Plaistow*.

Pratt, F. W. M., M.S. Durh., F.R.C.S. Eng., Hon. Surgeon to the Willesden General Hospital.

Selbourne, Hugh, M.D., M.R.C.P. Lond., Medical Registrar at the Southend-on-Sea General Hospital.

Spencer, S. L., M.B. Sydney, F.R.C.S. Eng., Surgical Registrar at the Southend-on-Sea General Hospital.

Trail, R. R., M.D. Aberd., F.R.C.P. Lond., Hon. Physician to Papworth Village Settlement, Cambridge.

Births, Marriages, and Deaths

BIRTHS

Dockray.—On July 22nd, the wife of Edgar Dockray, M.B. Edin., Cobham, Surrey, of a daughter.

Geldard.—On July 20th, at Sheringham, Norfolk, the wife of H. Colin Geldard, M.R.C.S. Eng., of a daughter.

Gipson.—On July 22nd, at Welbeck-street, the wife of T. Gipson, B.Chir. Camb., of a son.

Walker.—On July 21st, at Wolverhampton, the wife of Robert Milnes Walker, M.S. Lond., F.R.C.S. Eng., of a daughter.

MARRIAGES

Cutlack—Bowen.—On July 17th, at St. Andrew's Church, Cardiff, A. Russell Cutlack, M.R.C.S. Eng., to *Gwendoline* Ellen, daughter of Mr. W. Bowen, Treharris.

DEATHS

Bennett.—On June 28th, at Gerringong, New South Wales, George Herbert Bennett, M.R.C.S. Eng., *son* of the late John Nicholas Bennett, of Plymouth, in *his* 76th year.

Chill.—On July 23rd, Edwin Albert Chill, O.B.E., M.D. Edin., of Battle, Sussex.

Davidson.—On July 13th, at Murree, India, Robert Davidson, M.D. St. And., Lieut.-Colonel, R.A.M.C., aged 48 years.

Jones.—On July 26th, at Cambridge-street, W., William Howard Jones, M.B. Lond.

Le Riche.—On July 25th, at Worthing, Philip John Le Riche, M.R.C.S. Eng.

Sanderson.—On July 25th, at Basra, Iraq, Arthur Frederick Sanderson, M.R.C.S. Eng., son of Walter Sanderson, of Kew Gardens.

Wallace.—On July 23rd, Hygeia Leigh Josephine Wallace, M.R.C.S. Eng., of Plowden Buildings, E.C.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

"GRAVEYARD" WALKER—A FORGOTTEN BENEFACTOR

A curious obriquet with which to pass through and out of life. The owner thereof, though now forgotten, was, despite the strangeness of his appellation, a significant benefactor of his fellows, and earned his title, but little other recognition, by exposing grievous abuses and by strenuous agitation until remedy was effected. Sir John Simon, the first Medical Officer to the City of London, and later of the Board of Health and Local Government Board, in detailing some victories of preventive medicine recalls how the names of the protagonists have been forgotten, and ponders:

> "Doubtless this is so: but let the noble compensation be noted that often the thoroughness of a reformer's victory is that which most makes silence of the reformer's fame."[1]

Of few are these words so true as of "Graveyard" Walker. Who was he, and why should we endeavour to rescue him for a brief space from the oblivion of time?

George Alfred Walker was born in Nottingham in 1807, studied medicine in London, sojourned for a time in Paris, returned to London and practised his profession in Drury Lane, and died in retirement in Wales in 1884. His working life was consumed by one passion, that of the reform of the condition of burial places, a reform to which he was stirred in quite early years by sights which he witnessed in his native city. The subject is not a pleasant one. There may be room still for improvement in methods of disposal of the dead, but the conditions which prevailed a century ago are to-day unbelievable. Burial grounds, of limited space, often of private ownership, were situated amidst congested populations and the constantly increasing demands upon their capacity resulted in conditions which offended reverence, decency, morals and health. It would be ghoulish to dwell upon the abhorrent details which Walker accumulates in his various writings, but anyone who cares to study these may sup his full of horrors.

Sir John Simon, in reporting to the City of London, expressed the theme in forceful phrasing:

> "Nor can I refrain from adding, as a matter claiming attention, that, in the performance of intramural interment, there constantly occur disgusting incidents dependent on overcrowdedness of the burial ground; incidents which convert the extremest solemnity of religion into an occasion for sickness and horror; perhaps mingling with the ritual of the Church some clamour of grave-diggers who have miscalculated their space; perhaps diffusing amidst the mourners some nauseous evidence and conviction that a prior tenant of the tomb has been prematurely displaced, or that the spade has impatiently anticipated the slower dismembering of decay."

Dickens too, eager always to attack abuses, has drawn a graphic picture in "Bleak House":

> "'There,' says Jo, pointing, 'over yinder. Among them piles and bones and close to that there kitchen winder! They put him very nigh the top. They was obliged to stamp upon it and get it in. I could unkiver it for you with my broom if the gate was open. That's why they lock it, I suppose. It's always locked. Look at the rat!'"

And Walker placed on the frontispiece of his "Gatherings in Graveyards" some lines from another contemporary, Henry Kirke White, described in the "Dictionary of National Biography" as a poetaster, but in memory of whom the "Remains of Henry Kirke White," attaining to 10 editions, was compiled by Southey.

> "And who would lay
> His body in the city burial place,
> To be thrown up again by some rude sexton
> And yield its narrow house another tenant,
> Ere the moist flesh has mingled with the dust
> Ere the tenacious hair had left the scalp,
> Exposed to insult lewd, and wantonness?
> No, I will lay me in the village ground;
> There are the dead respected."

Well might Walker exclaim:

> "It is quite certain that any attempt to draw a parallel between the ancient heathen and the modern Christian in this respect would be infinitely to the disgrace and dishonour of the latter."

Walker had been stirred to revolt on this subject by scenes witnessed in early days, by further experiences in Paris, and his reforming zeal was continually moved by the loathsome evidence which pressed upon him in the densely-populated neighbourhood amidst which he later practised. He wrote books, of which "Gatherings from Graveyards," published in 1839, was the earliest; he lectured on his subject; he aroused public interest, and was mainly responsible for the appointment of a Select Committee of the House of Commons in 1842. Later, government inquiries and reports followed, the reform received the powerful advocacy of Chadwick, and ultimately in 1852 there was placed on the Statute book an Act to amend the Laws Concerning the Burial of the Dead in the Metropolis, the provisions of which were in the following year extended to England. These enactments opened the way for the remedy of the worst abuses, and were the forerunners of later legislation.

Thus "Graveyard" Walker lived to witness the fruit of his labours, but it is probable that none now ever pause to pay him tribute. After his death a contributor to *The Athenæum* of July 12th, 1884, wrote:

> "Others who took up the cry after him obtained the reward. His sole recompense was in witnessing the triumph at last of the cause he had so long and energetically advocated."

AFTER-CARE OF QUETTA CASUALTIES

After the earthquake of May 31st at Quetta the cases of severe fracture were transferred to the Mayo Hospital at Lahore, where it was possible to segregate in separate wards the fractures of different regions, spine, pelvis and femur. Balkan frames fitted with adjustable pulleys, weights and traction cable were available for all cases. Many fractured thighs were treated by stainless steel pins, transfixing soft tissues and bone, attached by a stirrup to the traction cable, the limbs being supported in flannel slings on Braun's cradles. In other cases the Kirschner wire was used, with the appropriate design of stirrup for this variety. Lieut.-Colonel W. Ross Stewart, I.M.S., reports that in no single case was there a sign of septic infection of the soft tissues or bone, and the patients were invariably comfortable. Although most of the cases were put up under local anæsthesia perfect alignment was attained. Many cases of fractured pelvis were treated by pin or wire traction applied to both lower limbs. "Aeroplane" splinting combined with transfixion and spring traction was used for fractures of the upper arm, allowing of movement of surrounding joints with no disturbance of alignment. Fractured spines were all reduced on a special table before splinting. Colonel Stewart notes that, although a host of workers had contributed to organise this surgical clinic and to improvise apparatus, there were none of the usual features of improvised equipment. Lieut.-Colonel D. H. Rai, I.M.S. and Lieut.-Colonel J. J. Harper Nelson had much to do with the provision of this surgical unit and the expansion of beds, but Colonel Stewart attributes the exceptional standard reached to the vision, energy, and skill of Lieut.-Colonel V. R. Mirajkar, I.M.S., superintendent of the and he who sweats too much. He whose habits are dirty itches, and he who is cleanly to a fault. It may be presumed that not all tramps itch—or not distressingly to themselves—but my Lady Vere de Vere certainly does not always escape by the frequency and complexity of her toilet. Pruritus may be general or local. It is the merest tyro who supposes that general pruritus is due to general causes and local pruritus to local causes. I am quite sure that pruritus ani, one of the most tiresome forms of pruritus, may be of entirely general origin, and this *pace* the proctologist, who, not unnaturally, takes the very opposite view and believes all cases arise from local causes. On the other hand a single acarus in its burrow may give rise to very extensive pruritus. When the cause is a general one as, say, in gout, the site of a local pruritus may often be determined by some local defect, but this is frequently so trivial as to go often entirely undiscovered. I will allow the dictum that if a pruritus be general the cause is more likely to be general than local, but my experience warns me strongly against the converse statement, that a local pruritus is more likely to depend upon a local, than upon a general, cause.

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[1] English Sanitary Institutions, p. 124.

General Causes of Itching

Amongst the more or less obvious, and serious, general causes of pruritus are diabetes, uræmia, and leukæmia. Jaundice is another, but not necessarily such a serious, cause. Pruritus in Hodgkin's disease is less known, but it is sometimes such a marked symptom here that its presence may be helpful in diagnosis, seeing that it does not seem to occur in that form of tuberculous adenitis which not infrequently conflicts with lymphadenoma. Pruritus occurs in hyperthyroidism, both with, and without, skin lesions. It also occurs in pernicious anæmia and in other conditions involving hæmolysis. I have met with two very troublesome examples of it after splenectomy, accompanied, in one of the cases, by urticaria. Though it is usual in these days, when the microbic hypothesis still holds such sway in our minds, to search for "focal sepsis" in all cases of generalised pruritus, convincing evidence of the causative association of the two conditions is less often forthcoming than is usually taught. The most common forms are dental and gall-bladder sepsis and chronic colon bacillary infection of the urinary tract. Pruritus must be quite unusual in tonsillar sepsis and in sinusitis.

Since the term "intestinal toxæmia" connotes at least three different pathological processes, to say this is a common cause of pruritus tells us nothing definite. (i) The ingestion of certain substances to which patients are "sensitised" is very likely to cause pruritus, a matter to which I shall return later. (ii) Bacterial sub-infection of the bowel may cause pruritus, but the association in a causative sense is almost impossible to establish. (iii) The doctrine of "copræmia," meaning the absorption into the blood stream of certain retained products of fermentation from food principles, has never been submitted to scientific research. Even the statement, so commonly made, that constipation is a frequent cause of pruritus, may be challenged. I have met with several patients who developed pruritus after fiddling with their bowels, though it is extremely difficult to say, in such cases, if the itching is the result of an abnormal degree of absorption from a more frequently denuded mucous membrane, or of the chemical agent used as an aperient.

Of all the general causes of pruritus, however, the most common is "gout." Did not an ancient physician call itching "the lisping of the gout?" The word is, as we know, somewhat *démodé*. But to rid medical nomenclature of the word "gout" does not rid medical practice of the gouty patient. Acute articular gout is, no doubt, far less common than it formerly was: so much less common indeed, that when it appears it not seldom fails of recognition. But goutiness is as common as ever, if not commoner. But what *is* gout? Is it an entity? Is it one thing or is it several things? The time is not ripe, even now, for answering these questions. We know what gout is *not*: it is not poisoning of the body by uric acid, still less is it due to a deposit of biurates in the tissues. It seems probable that there is a basic pathological process in all cases, but the vagaries introduced by the individual equation are so numerous and so important, that we must almost consider each man's gout to be his own, and study it as such, if we are to achieve a therapeutic success. What structures in the body are mainly concerned in this postulated basic mechanism is largely a hypothetical question. That the liver looms large in this field seems probable. Yet we may find, later on, that the dominant tissue is not this, but something more subtle, and not as yet revealed. The discovery of the reticulo-endothelial system and its influence upon the blood-forming organs suggests strongly that we have by no means exhausted the discovery of tissues and tissue functions by combining histological with metabolic research.

Allergy

The relation of goutiness to allergy is as yet undetermined but that there is some close association seems highly probable. The concept of allergy, originally much too limited in its application, has probably become to-day much too unconfined. Or perhaps it is more true to say that the notion has far outstripped the facts—a way that all new notions have. Richet's fundamental observation of the phenomenon which he called *anaphylaxis* gave clarity and cohesion to a large number of clinical experiences. But until we know much more about the exact happenings in the production of this state of sensitisation we cannot say how wide its application may be. It seems probable that in the case of the skin the doctrine of allergy is applicable to many more conditions and to many more patients than is generally supposed. Urticaria and its ally angeioneurotic œdema, with some forms of eczema, especially in children, appear to cover the allergic group of skin affections in most books dealing with these matters. Just as the dramatic syndrome termed asthma, with its ally, hay-fever, seem to absorb the same attention in the respiratory field. I think most cases of lichen urticatus should be included in this group, and in this connexion I would add, incidentally, that this disease is by no means confined to children, as many authors suggest. I am equally confident that a great deal of pruritus, both general and local, whether associated with demonstrable lesions or not, also deserve inclusion, in addition to the itching disorders already mentioned.

The fact that serum-sickness has frequently an incubation period of 8–10 days goes to show that considerable latency may exist between cause and effect in pruritic diseases, though it is true to say that when the irritant is inhaled, or is absorbed from the alimentary tract, the evidence of sensitisation is usually much more rapid. There are some general considerations of importance which suggest themselves in this connexion. (i) It is too often asserted, and dogmatically, that the allergic patient is sensitised specifically. But there are many individuals who are sensitised against a large number of substances, and this fact introduces great difficulties both in diagnosis and in treatment. (ii) The question whether the irritant in allergic patients is always a protein is supposed to be settled in the negative, the experience of drug idiosyncrasies being adduced in support. But the argument is by no means so simple as this. If drugs do good indirectly, as we know many do—the arseno-benzol group for example—it is just as likely that they do *harm* indirectly, setting free some protein fraction in the circulation to produce allergic effects in the skin or elsewhere. (iii) Not only are some individuals sensitised to a number of different substances, *they may show their allergic tendency* n a number of very different ways. And those ways o not always alternate, as do the classical examples f eczema, asthma, and certain forms of arthritis. he most catholic example amongst my own patients a man who became sensitised after small-pox accination with suppuration under the scabs, at the ge of 25 years. He suffers from both paroxysmal hinorrhœa and stuffy nose. He has had several ttacks of acute articular gout, being awakened in he early morning with an excruciatingly painful, pink, lossy and swollen foot. A small dose of medinal keeps him awake all night with severe urticaria. Beer, chicory, the whisky of some of his friends but not all, and he keeps a list of these), and some ngredient in Worcester sauce which is not in any of ts competitors keep him equally restless and sleepless with intense pruritus ani. He was once stung by a wasp and collapsed instantly, requiring volatile stimulants and other restoratives.

The Nervous Factor

The last of the general factors to touch upon but, in some respects, the most important, is the nervous factor. The overlap of the nervous factor with both gout and allergy is considerable. But the influence of the nervous system upon metabolism is too large a subject for this address if, indeed, it be not too large a subject for any single address. The introduction of the word "neurotic" by Quincke into the designation of the disease which bears his name is fully justified by a study of the cases. Even though the allergic factor in this and other skin diseases is established, this does not minimise the importance of recognising the element of nerve instability in many of the patients affected. Sometimes this instability is central, sometimes it is autonomic, sometimes both. Here again, each case must be taken on its merits. We must avoid the stigma that the use of the word "nervous" *often conveys to a sensitive patient*; or if we use the word, or condone it, we must explain that it by no means necessarily reflects upon the patient's behaviour or has any moral significance. If confidence be needed, we may cite examples of men and women who have made great contributions to life and yet who suffered from some form of neurosis. But the patients who possess a central nerve instability, who are psychotic in fact, present a problem of their own. To help them we cannot know too much about them, soul as well as body. To have it said of a medical man: "I found myself telling him everything" is a good compliment. And to create the atmosphere that makes self-revelation easy, indeed, makes self-revelation inevitable, is the acme of good doctoring. If, now, the process can be continued and completed by the same doctor, in the same room—even if the exigencies of practice do not make it possible that it should be continued at the same time—without the break introduced by an appointment made at a new address, with a new doctor bearing the ponderous title of psychotherapist, so much the better. Organic diseases of the nervous system lead to rather surprisingly few instances of pruritus, and it is only want of care in attending to the patient's description of his dysæsthesiæ that leads to a misinterpretation of these in terms of pruritus in (say) an early case of subacute combined degeneration.

Of local causes of pruritus I do not propose to treat in detail. Charles Lockwood, a man to be remembered as much for his gift of teaching as for his poineer work in aseptic surgery, was wont to exhort his pupils "always" to "examine the part the patient complains of." The injunction seemed superfluous, almost silly, and yet the most careful amongst us are now and then found to be negligent of this very trite advice. The reminder applies with tremendous force to affections of the skin, and to remember it in a difficult case of pruritus saves us from many a pitfall. All the same, it is pertinent to repeat here what I have already remarked, that there are few cases of local pruritus in which a general factor is not present.

Treatment

I have sometimes been as guilty as Lockwood in the matter of *obiter dicta*, and I do not disclaim plagiarising the description of his art attributed to Demosthenes, by saying that the most important thing in treatment is diagnosis, the next most important thing is diagnosis, and the third most important thing is—diagnosis. To no complaint, again, does this truism apply more than to pruritus.

Having unearthed the ætiological factors, both local and general, we must deal with these as patiently and as persistently as possible. Always facing the patient with the imperative need for his coöperation. We cannot live his life for him; it would not help him in the end if we could. It is sometimes necessary to get a clear issue on the point whether it is really worth his while being free from his trouble. How much self-indulgence, for example, is he prepared to give in exchange for comfort to his skin? Here is *not a question of his skin as symbolical of his life; we know about that; we know that "all that a man hath will he give for his skin."* What he is prepared to give to avoid pruritus is quite a different proposition. In the majority of cases the truth remains that a man can have almost anything he wants in life if he is prepared to pay for it. Here he is called upon, not infrequently, to help in the diagnosis. If he be allergic he must keep a food diary, *and take some trouble about it, too. He* must brace his mind to the questionnaire put to him by his doctor, and he must be loyal in carrying out the régime prescribed for him, not omitting some item because it seems to him to be trivial or devoid of meaning. We soon discover the degree of his disability by his reaction in these matters.

Most patients, and quite reasonably, prefer artificial methods of therapy to natural methods, and those methods that have kinship to "direct action" in politics are the most attractive of all. But in the case of pruritus we have not got many remedies of this class on hand. Or certainly not for permanent, *as against temporary*, relief. In the allergic patient, for example, our available methods of desensitisation, both specific and non-specific, are at present very disappointing. In theory they are most convincing, in practice not so. Just as "knowledge comes but wisdom lingers," so does theory arrive but practice lag behind. And so we find that avoidance of the peccant substance, whether in the food or in the air, or the clothes or the furniture, though more bothersome, is more effective. But this means care and trouble and—dare it be said?—intelligence. And, as I say, the question arises: is it worth while? After all, just as "life is more than meat and the body than raiment," so a bout of itching, even to the degree of suggesting the inquiry "what is the doctor doing about it?"—and most of the minor disturbances in life tend to raise the query in this soft age—may be a very mean payment for a good dinner, a cocktail or sherry party or the vanity of toilet powder and a fur boa. The position should be faced clearly and as clearly stated. Our function is to explain and guide, not to govern and control.

There are few cases of pruritus for which we cannot do a good deal and fewer still for which we cannot do something. I do not think there are any for which we can do nothing. The most intractable cases of all are those instances of diffuse itching which go by the depressing name of "senile pruritus." The use of this term stultifies our efforts at diagnosis, it does not add to our knowledge. In quite a number of these cases the patient is in many respects young, and not old, for his years, is of the alert and active type, and a close examination of his skin does not reveal evidence of that atrophy which is too often assumed to be present. On the other hand we frequently see skins that are definitely atrophied, in still older patients, with no such disability. The other statement, so frequently made, that the subjects of so-called senile pruritus are troubled by "imperfect metabolism" is another assumption, unhelpful from its very vagueness. Every one of these cases must be taken on its merits and thoroughly investigated. Of the underlying morbid conditions present in them, goutiness, an unstable nervous system and focal sepsis are perhaps the most common. The question of septic teeth involves the physician in the difficult dilemma that he cannot promise an adequate return from extractions, yet he knows that to follow established principles is his only safe procedure. Goutiness demands careful and individual treatment: n general advice can be volunteered. The most usef drug in the nervous type of pruritus is luminal, in a small a dose as produces effects. An older remedy i cannabis indica, but the drug seems to lack potenc these days or, if trouble be taken to secure an active preparation, the patient is prone to complain of odd symptoms that alarm him—and he is too often the sort of person who is very easily alarmed

When, in a difficult case of pruritus, we have done our utmost in removing all possible local irritants and congestions; when we have placated the unstable nervous system; when we have brought the swinging metabolic pendulum to rest; when we have exploited the doctrine of allergy to the full; when we have tracked down focal sepsis to the last ditch; the pruritus may still persist. We have treated the disease and now our traditions, as well as our duty, demand that we treat the symptom, in this event itself the disease. To talk of unguents and lotions to an audience of dermatologists would indeed be taking coals to Newcastle; would add the insult of supererogation to the injury already done to your patience. I may be excused, however, for adding a few words concerning X rays, partly because the tendency to employ this therapeutic measure is increasing, partly because it is at times so strikingly effective, and partly to inquire if there be any dangers in the method.

Results of an Inquiry

So that what I may say on this subject shall not be only the result of my own experience, I recently canvassed five dermatologists and five radiologists for their views. I naturally chose colleagues whose practice is extensive and whose judgment I knew to be reliable. A composite analysis of their answers, for which I take this opportunity of thanking them very cordially, confirms my own opinion on the subject. It will not be a surprise to learn that the radiologists are, on the whole, rather more enthusiastic concerning this therapeutic measure than are the dermatologists. Nor that the degree of enthusiasm amongst both groups varies considerably.

I will state the conclusions of these experts in a few brief sentences:—

1. There is general agreement that in pruritus ani and pruritus vulvæ, and in other forms of localised pruritus, X rays frequently produce marked relief. The figures vary from 90 per cent. to 60 per cent.

2. There is general agreement that "cure," by which I understand is meant complete cessation of the symptom, occurs in a considerable number of cases. The figures vary around 50 per cent.

3. There is general agreement that in diffuse, as against local, pruritus, the treatment fails.

4. The majority use small doses, but a minority states emphatically that heavy doses are more satisfactory.

5. The note of caution is sounded by most, and the note is, again not unnaturally, rather louder in the case of the dermatologists than in that of the radiologists. One of the latter gives as his working rule: "if no response follows the first treatment, proceed cautiously; if no response follows the second, discontinue." He adds: "proceed with extreme caution when patients have already had X ray or radium treatment."

6. Without exception the derma upon the importance of a comple radiologists do likewise, either assumption th their general med already borne in mind the great i point.

7. It is not without significance th logist who was the first physician in skin diseases by X rays writes the of the letters with regard to the submitted to him.

Where the experts find it so diffi unanimity it is excusable for the non-exp Perhaps the truth lies here, as it does many therapeutic measures: be bold, not too bold.

THE COD-LIVER OIL TREAT OF WOUNDS

By John P. Steel, M.D. Edin.

MEDICAL SUPERINTENDENT, SMITHDOWN ROAD H
LIVERPOOL

THE annotation in THE LANCET (1934, calling attention to the use of cod-liver oil treatment of burns and septic wounds by Wilhelm Löhr of Magdeburg, was of sufficie portance to warrant a trial of the metho described. Burns are seldom received at a hos without first-aid treatment having been given out usually in the form of an *oily dressing* applied to burnt area; for this reason the tannic acid met is not often applicable without extensive skin to requiring in many cases a general anæsthetic. Pic acid is also extensively used for its analgesic prope ties, and tannic acid is not readily applicable *on* suc

a surface. Where skin toilet was not YMENT
was the practice in this hospital to follow
dressing by the application of liquid para R.C.P. Lond.
vaseline, as continued application of pic Y HOSPITAL ;
led to unpleasant results in cases of idio , BRITISH

The application of cod-liver oil seem
method and so generally useful that it
to treat minor burns in an endeavour t
value, and the comparison was very e "industrial
tannic acid and the other oily dressings. which compen-
panying illustrations will show that war neuroses"
decided that the use of cod-liver oil was the effects of
not only in burns of a minor degree, but te have also
of much greater extent and penetrat years. There
in fact, been so successful that it is n conditions in
routine here to treat any burn with cr indispensable
oil. The main advantage is that, on a maintaining
matter what has been applied outside it is ial influences
to undertake any extensive skin toilet be who respond
dressings. e what other

At first it was thought that cod-liver these few, as
into an ointment with some waxy base nences, emain
in closer contact with the burnt area, bu was soon
found that the dressing, when the time can for renewal,
was either dry or inclined to draw th granulated
tissue away with the remains of the waxy ointment.
To overcome this difficulty, lint, heavily soaked in
cod-liver oil, was applied widely over the part to be
treated, and was taken off at the end of 12 hours.
With experience it has been found that once in 24
hours is sufficiently often to uncover the dressing,
which is now left in situ and re-soaked with cod-liver
oil, the lint not being taken from the skin surface until
the end of 48 hours—an obvious advantage where the
area to be treated is large.

Löhr and Winnett-Orr of Nebraska (THE
1933, ii., 357) use the occlusive method, but
occlusion that we have found necessary is
the dressing by jaconette, in an endeavour
the lint saturated. Crude cod-liver oil is
m the commencement in all cases. Where
ve not reacted previously to the ordinary
it has been found that cod-liver oil hastens
. and the speed with which an indolent area
formed into one of healthy granulation is
ble. The treatment too is popular. Almost

or resentment, and (hysterical) conversion symptoms were found; often all of these would be discoverable, and seldom less than four. Outstanding features were a preoccupation with discomforts, whether expressed in physical, mental, or social terms, a feeling of dissatisfaction or resentment in regard to them, and various expressions of anxiety; trembling was frequent. The complaints were commonly vague, but expressed with great earnestness, often also with rich prolixity and as though learnt off by heart. Sometimes these complaints verged on the bizarre—e.g., "when I eat the food it gets just here and it keeps on boiling and wind, and after my food this right leg of mine goes dead . . . . Like an acid it keeps on fermenting in my mouth. And the wind works round me here. And it goes dead, I got no feeling. And this fluid seems to work all through my body, this acid boiling up: all my food seems to go to it . . . . White stuff dries in my socks . . . . Then when the doctor stroked the soles of my feet, he struck the delicate spot and it ran all up my leg . . ."

A majority had a grievance against the pension authorities, the public assistance committee, medical boards, or society at large—"the capitalist system."
is was not expressed as a delusion but as a general
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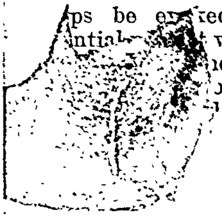
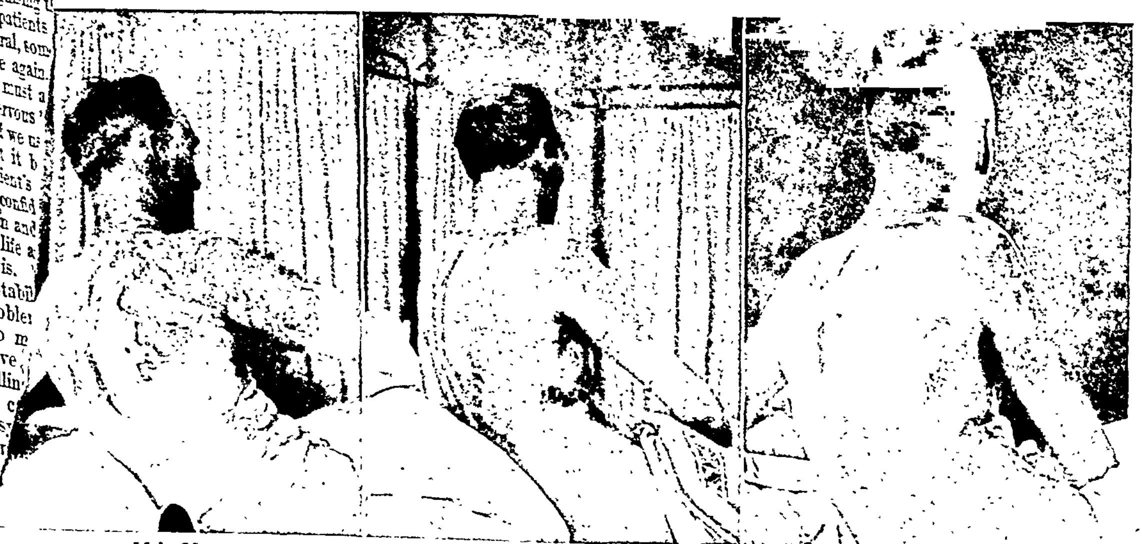


10.iv.35 24.iv.35

FIG. 1.—Scald of second and third degree dressed with crude cod-liver oil.

every patient has said that the first application of cod-liver oil has given much greater ease than other dressings. One case, which is not illustrated, may be quoted.

A marine fireman, who was scarred in almost every part of his body, was burnt on the left arm, shoulder to elbow,



15.iv.35 17.vi.35 28.vi.35

FIG. 2.—Extensive burn from a fall into the fire similarly treated.

is more effective. But this means care and trouble and—dare it be said ?—intelligence. And, as I say, the question arises: is it worth while? After all, just as "life is more than meat and the body than raiment," so a bout of itching, even to the degree of suggesting the inquiry "what is the doctor doing about it?"—and most of the minor disturbances in life tend to raise the query in this soft age—may be a very mean payment for a good dinner, a cocktail or sherry party or the vanity of toilet powder and a fur boa. The position should be faced clearly and as clearly stated. Our function is to explain and guide, not to govern and control.

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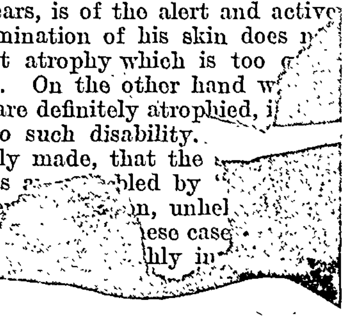

FIG. 3.—Septic ulcer similarly treated. The photographs were taken on 30.iii., 4.iv., and 20.iv.35.

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panel doctor for an acute intestinal obstruction, and it was found that not only was there no scarring from the recent burns, but the brown pigmentation, which is so often left after this treatment, had entirely disappeared. Another case confirms this opinion.

A woman, aged 25, had been in hospital for more than two and a half years as the result of extensive burns caused through falling into the fire at home. She had been treated by varying methods over a period of two years, and extensive scarification had taken place to such an extent that her chin is pulled down at least 1½ in. towards the chest wall. In the areas where no actual healing had taken place skin grafts were attempted but did not take. Finally cod-liver oil was used on the sites where no healing had occurred, and we are now presented with a picture of islands of unscarred healthy skin lying in the middle of extensive scars.

Two cases of burns treated by Löhr's method from the onset may be briefly related.

A. B. (Fig. 1) was scalded over the whole of the left forearm to the second and third degrees by a pan of boiling fat, and was admitted to hospital on April 10th suffering intense pain. Dressed with cod-liver oil, he said the pain was at once relieved. He was discharged 14 days later without a vestige of a scar, and within a month the pigmentation had disappeared.

C. D., reputedly an epileptic, was admitted on April 15th and discharged on June 28th. His extensive burns were the result of a fall into the fire, and his progress under a cod-liver oil dressing may be traced in the photographs (Fig. 2). He was discharged with nothing but a dry dressing. No scarring followed even in so extensive a burn as this.

With such good results in burns, it was decided to try crude cod-liver oil as a dressing in other cases. Indolent ulcers and deep abrasions were so treated, but ing the rule "if there is pus, it must With this proviso cod-liver oil treatment und of advantage in a great number of areas. After the removal of pus or patches of skin, oil applied in the way s induced rapid granulation of tissue lolent in leg ulcers and even in fistulæ. stula had been in hospital 34 days under nent and still showed a slight serous ter packing the wound for six days with he patient was able to leave hospital, ed to make two out-patient attendances l of the dry dressings. Fig. 3 shows how ation is induced.

septic area on the leg for three weeks whilst tis and sloughing of the skin of the right foot l. He was in hospital 17 days under cod- eft almost entirely cured. On reporting one hing was to be seen of the wound save a mentation which disappeared in a few days.

There is distal and proximal surfaces of a joint are in local, no immobilisation is undertaken and no occlusion attempted except that obtained by a covering of aconette. Crude cod-liver oil is used and is applied by lint saturated therein. The dressing is not removed for 48 hours, but at the end of the first 24 hours—or more often if it seems necessary—it is re-soaked in situ with cod-liver oil. In certain cases at the end of a week the granulations are found to be exuberant; cod-liver oil dressing is then replaced for 24 hours by red lotion or a paste with a zinc base.

The only disadvantage of the treatment, as noted in your annotation, lies in the somewhat unpleasant smell from the dressing, but this can be mitigated by frequent change of bed linen. At one time we included an aromatic in the oil, but gave it up as it did not seem worth while. Sometimes the scent of the oil seems to make a patient less ready for his food, but this mild nausea soon passes away. The advantages are obvious: the ease which the patient obtains from the first dressing, the abolition of frequent change of dressings (with consequent pain and disturbance to the patient), and the almost total elimination of scar tissue. The brown pigmentation which is found on the healed skin clears up without further treatment.

A laboratory comparison was made between liquid paraffin and cod-liver oil, 10 c.cm. of either being inoculated with *Staph. pyogenes aureus*. In the case of cod-liver oil after 48 hours' incubation, subcultures on agar proved that although the organisms were still alive the growth was inhibited. The same result was obtained with liquid paraffin over a week. Obviously neither is a suitable medium for the growth of the organisms, and this will account (as Löhr reports) for the change of an unhealthy surface into the "clean ruddy picture of healing."

Whether the vitamin content in cod-liver oil has a natural affinity for the skin and the underlying tissues it is difficult to say, but there is obviously some factor in cod-liver oil which is not present in such oily dressings as liquid paraffin. This "something" has the effect of much more rapid healing and the almost entire elimination of scar tissue.

EASTERN HOSPITAL, HOMERTON.—Mr. Somerville Hastings recently opened the new isolation block erected by the London County Council at Eastern Hospital, Homerton. It is a two-storey building and provides accommodation for 60 patients in single-bedded wards.

NEUROSIS AND UNEMPLOYMENT

y Aubrey Lewis, M.D. Adelaide, M.R.C.P. Lond.

FIRST ASSISTANT MEDICAL OFFICER, MAUDSLEY HOSPITAL; CONSULTANT IN PSYCHOLOGICAL MEDICINE, BRITISH POSTGRADUATE MEDICAL SCHOOL, HAMMERSMITH

Much has been written about the "industrial euroses" that follow accidents for which compenation can be claimed, and about the "war neuroses" n which pensions play a part. The effects of nemployment upon the mental state have also een much spoken of in the last few years. There re, in short, gener [illegible] recognised conditions in hich social influen [illegible] to play an indispensable art in provoking [illegible] lness and so maintaining ocial incapacit [illegible] nce these social influences ct upon man [illegible] an the few who respond with neurosis, [illegible] portant to see what other predisposing factors are at work in these few, as well as the social and clinical *consequences of the* adverse circumstances.

A special group was available for such inquiry. A series of patients on out-relief had been seen in whom presumptive mental disorder, generally of a mild chronic kind, was associated with long periods of unemployment. They were referred to the Mile End Psychiatric Clinic by the local public assistance committees (P.A.C.) for an opinion as to diagnosis and treatment. Fifty-two successive male cases, so referred between May, 1931, and June, 1932, have been taken for study. They do not form a representative group of people on out-relief, nor perhaps even of those on out-relief who had been diagnosed as neurasthenic, for the process of referral was not a routine one but depended on selection of appropriate cases by the various district subcommittees of the P.A.C. In age they ranged from 20 to 67: seven were between 50 and 65, thirty-two between 35 and 50, thirteen between 20 and 35. The information about them was obtained by the following inquiries:—

1. A social history was obtained from a relative of each patient, prior to his attendance at the psychiatric clinic, by a psychiatric social worker.
2. The P.A.C. supplied details of medical history in most cases.
3. The psychiatrist examined the patients on one or more occasions and recorded the findings.
4. The case papers of the P.A.C. giving the whole history of the patients' relations with the administrators of out-relief, under the guardians' régime and that of the present P.A.C., were put at the disposal of the psychiatric social worker. The relieving officer who dealt with each case was interviewed in person.
5. In 49 of the 52 cases the psychiatric social worker visited the patient's home at a later date, saw him, his wife or a relative, and ascertained the subsequent happenings.

Only a brief account of the voluminous data accumulated can be given here. For them I am indebted to Miss M. A. Lane, the psychiatric social worker attached to the clinic, and to Miss Janet Galloway, who as research social worker at the Maudsley Hospital has studied the social aspects of this matter fully; her findings are being published elsewhere.

The Clinical Features

The clinical pattern was remarkably uniform. It was that of a chronic neurosis in which hysteria predominated. Various combinations of anxiety, irritability, hypochondria, depression, querulousness or resentment, and (hysterical) conversion symptoms were found; often all of these would be discoverable, and seldom less than four. Outstanding features were a preoccupation with discomforts, whether expressed in physical, mental, or social terms, a feeling of dissatisfaction or resentment in regard to them, and various expressions of anxiety; trembling was frequent. The complaints were commonly vague, but expressed with great earnestness, often also with rich prolixity and as though learnt off by heart. Sometimes these complaints verged on the bizarre—e.g., "when I eat the food it gets just here and it keeps on boiling and wind, and after my food this right leg of mine goes dead . . . . Like an acid it keeps on fermenting in my mouth. And the wind works round me here. And it goes dead, I got no feeling. And this fluid seems to work all through my body, this acid boiling up: all my food seems to go to it . . . . White stuff dries in my socks . . . . Then when the doctor stroked the soles of my feet, he struck the delicate spot and it ran all up my leg . . ."

A majority had a grievance against the pension authorities, the public assistance committee, medical boards, or society at large—"the capitalist system." This was not expressed as a delusion but as a general attitude of touchiness and resentment, which would perhaps be evoked in a previously friendly and deferential patient when one asked him what standard he had been in when he left school, whether he had a pension, what work he had been able to do in the last two years, whether he had used any form of contraception, and so on. In 17 of the patients this attitude was very evident, and had at some time led to more or less severe outbursts of rage or violence. Convinced assertions of victimisation, made in apparent calmness, were never obtained, and the patients showed, to express it in psychiatric terms, a paranoiac reactive development of personality, rather than a paranoid delusional formation.

Irritability was commonly complained of, or was reported by the patient's wife; it was always associated with some depression. Depression was observed and reported in 30 of the patients, but (like all the other symptoms mentioned) may well have been present, though at the time of examination unobstrusive, in many more. It rarely was extreme and in no instance was it associated with self-reproach or delusions. It is remarkable that in a few of the men it was apparently not the case that they were depressed; they were cheerful, in spite of the shaking and other discomforts, they slept and ate well, and their general manner suggested that they were content. It would of course be unwise to assume that these patients were happy or that their general mood differed greatly from that of many others who were said to be, or professed themselves, depressed, and who wept or looked glum—though unconvincingly—while reciting a catalogue of queer feelings and tremors.

The doubtless complicated and equivocally shown attitude of these men towards their situation and their symptoms cannot easily be expressed in simple affective terms, such as "depressed," and their affect was *not* so sweeping and unvarying as in the familiar psychiatric disorders of mood; it corresponded more to the instabilities of psychopathic personality. Anxiety was a common feature among the patients; in 28 it was conspicuous, and in almost all demonstrable. The modes of its manifestation varied; clear-cut anxiety attacks, not obviously occurring in terrifying situations, in which the somatic expressions were brief, widespread, and "classical"; or sweating, trembling, and dread before medical examination and other more or less important occasions; or constant restlessness and ill-defined apprehension occurred, as well as localised anxiety in which the activity of the heart or other organ was the centre of anxious preoccupation. Phobias—e.g., against crossing the street or riding on a bus—were not infrequent. Tremor was one of the most common findings; it was striking in 23 of the patients and was observed in most of the remainder; it was in many cases obvious to the casual glance—coarse, uneven, with jerkings or twitchings of the head and trunk as well as of the extremities; and in a large number it was the chief symptom complained of. Where it was a fine tremor other evidence of anxiety was present: where coarse or odd, less of general anxiety and more of interest in the symptom was the rule.

Three of the patients showed a mild pseudo-dementia, professing not to understand questions or giving inappropriate answers; they were unintelligent men who resented questioning, and their behaviour may perhaps be regarded as an intentional effort to mislead the examining physician. One patient had had a fugue, and he fell about when he walked: two others had a gross, anomalous stammer. These were all hysterical phenomena. Five of the patients were chronic schizophrenics, and 3 of these had been in mental hospitals: in none of them were the symptoms recent, the onset had been at least 7 years before: it is unnecessary to describe the symptoms they showed, which included affective incongruence, characteristic thought-disorder and paranoid hallucinations. There was one epileptic patient, and 6 in whom arterio-sclerotic changes were present and seemed contributory to some of the "mental" symptoms—e.g., lacrimose expressions of anxiety. In one patient a diagnosis of cortical degeneration, possibly of vascular origin or conforming to Pick's disease, was made.

Causal Factors

On a careful survey of the history of each of these patients, one could understand how the present illness had developed. This way of thought, however, can be deceptive since it ignores the alternative modes of response to those taken by the patient and is willing to leap over unknowns: it may be no more than fitting the data into one's preferred scheme of mechanisms and consequences. It is however the most satisfying and profitable way of regarding the individual case clinically. In distrust of this clinical approach, one may look for the common occurrence in these patients of presumptive causal factors, or to put it more correctly, for biographical data which characterise this group, and to some extent differentiate them from people with other illness, or from healthy people. Unfortunately, on many of the points investigated in this series, comparable data for the rest of the population are not at hand.

In this group, therefore, it was not so much the "causal" factors but rather the common peculiarities that were examined—these were concerned with social and medical facts and extended over more than the individual history of the patients.

THE FAMILY

The fathers of the patients had in 26 of the 45 known cases been unskilled workers; in these 26 the size of the family to which the patient belonged was nine children, whereas it was seven children in the 19 cases where the father had done skilled work. There were 7 instances in which a parent or sibling of the patient had been for years in a mental hospital: in these relatives schizophrenia, involutional melancholia, and mental defect were the diagnoses, while in all of these 7 patients themselves there was some departure from the clinical picture presented by the majority: in 1 there was extreme hypochondria of a bizarre sort, in another a paranoid psychosis, 2 were schizophrenic, 3 were mentally defective. It is very probable that the details obtained about the family history were incomplete, so that an appraisal of the findings might be misleading. The further information under this head is as follows: in 5 of the cases "nervousness" in one form or another (mostly anxiety states) was reported in parents or siblings: alcoholism in 7, in 3 asthma, in 4 epilepsy. In 8 patients, tuberculosis occurred in other members of the family. All these facts are probably underestimates. The parents of 4 of the patients had lived apart; 3 patients were brought up in an orphanage, and 1 who was illegitimate had been brought up by a foster mother; one of their parents had died during the childhood of 8 of the patients. The places of the patients in the order of births did not appear significant, collectively.

PREVIOUS EVIDENCE OF NEUROSIS

In 12 cases there had been in childhood neurotic traits, such as shyness, extreme sensitiveness, restlessness, somnambulism and day-wandering, unmanageableness, nail-biting, incontinence of urine and fæces, facial tic, and fits. During adolescence one had been delinquent, another had had fits. Serious ill-health in childhood appeared to have had a considerable influence on development in 3 cases. In 23 of the patients there had at some time been overt evidence of mental illness. Thus half the patients who had been in the army during the war were discharged with the diagnosis of shellshock, neurasthenia, or D.A.H.: almost all of these received pensions, for a time at least. Ten of the 25 non-army cases had shown some anomaly (epilepsy in 2 cases, delinquency in 2, neurosis after trauma in 3, and single instances of other disturbances). The physical health of the patients during adult life is considered below. In the work record and war service of these patients significant hints or plain evidence of neurosis appear.

OCCUPATIONAL HISTORY

Two thirds of the men were unskilled workers, a higher proportion than was found among claimants for unemployment benefit by the Ministry of Labour in 1925 (51 per cent.). In 11 of the cases the father had been skilled, the son was unskilled; in only 5 did the reverse hold true; in 7 both father and son were skilled.

Owing to the varied ages of the group, the facts about working life and duration of unemployment could not easily be compared. For various reasons it seemed best to estimate first the individual efficiency of each patient prior to his first post-war application for out-relief: 14 of the cases could not be so treated because of their youthfulness and brief period of industrial life. Of the remaining 38 there were 26 with satisfactory work records—i.e., they had held one job for seven years at least, or had not changed their jobs frequently without improvement of status. Seven of the 12 men who had unsatisfactory records in this respect had previously applied for out-relief (i.e., before the war), and the other 5 had aimlessly changed from job to job and might be called "feckless" or unsettled.

As there was a rapid increase in unemployment and dependence on out-relief in London between January, 1920, and January, 1923, with its peak in 1922, it might be supposed that extraneous factors d played a large part in bringing about the unemoyment of the group under consideration. Actually e highest number of them applying in any one year d so in 1920, before the difficulties had reached eir maximum. Of the total 52, 36 had applied for lief a year before the height of the out-relief figures r East Londoners as a whole had been reached.

In each case the reason for the application for ut-relief had been inability to support the family ecause of inadequate or no earnings. Actual illness nd particularly neurosis had not been given as the eason for loss of occupation. It must however be emarked that 36 of these 52 men had on one count r another previously shown some inadequacy: they ad been diagnosed as neurotic (24 cases) or as entally defective (3 cases) or had experienced he "pension situation"—i.e., had had some income, hich was not current earnings, in the form of war ension or pre-war out-relief. Nineteen of them uring their unemployment received National Health nsurance benefit for varying periods.

The amount of employment since the first appliation for out-relief is very little. Ten of these men ave been unemployed for ten or more years, 34 of hem have done no work lasting more than two veeks for the last five years or more. Half of them ad been completely idle for the four years before heir referral to the clinic, and only 6 had had more than a year's work during that time. One who showed mental defect, has never been employed at all. Eleven of the men have done no work for years except hop-picking in the autumn. The wives of 8 of them, incidentally, worked while their husbands were unemployed, but in only one instance was the work full-time.

WAR SERVICE

Just over half of these patients had been in the Army. Of the remainder, 10 were exempt because of their age, 4 were rejected as unfit, and 10 were either exempted or rejected on indefinite grounds. Of the 27 who were in the Army, 8 did not go overseas at all; 4 of them were discharged unfit soon after enlistment, and the rest were not called up until towards the end of the war. Nineteen saw active service; only 4 were discharged from the Army without any disability. Of the 19 on active service, 12 were awarded pensions, and so were 2 of the eight who were never sent abroad. Of the 14 pensions, 10 were for nervous disability, and 3 other men who did not receive pensions were similarly diagnosed neurotic on discharge from the Army.

It is evident that a large number of these men eligible for war service were either initially recognised as unfit to meet the stresses of war or later proved so.

PHYSICAL ILLNESSES

Physical illness had been recognised in 13 of these patients before their first post-war application for out-relief. In the individual cases the influence of this on general development seemed clear. Two of them had heart disease; in one case it was first diagnosed in adolescence, and in the other it has since brought about the patient's death. Two had had attacks alleged to be epileptic; others were tuberculous or had sustained injuries or were defective in some respect—e.g., crippled.

As the pension or compensation situation has so many analogies with out-relief in its possible deleterious effects upon personality and mental health, it is worth noting that besides those with Army pensions, 6 of these men have received compensation for injuries sustained since the war. Machine accidents to their hands and accidental falls had resulted in the receipt of a lump sum: in all these men neurotic symptoms had been evident before the happening, and probably they were more prone to accidents than is usual. Another patient injured one eye so that it had to be removed in 1930, at the age of 48: impaired vision in the remaining eye made work impossible. It is only since then that he has shown definite neurotic symptoms; he claimed but did not receive any compensation or insurance. Two other patients received compensation for injuries sustained by their children.

One of the patients when examined at the psychiatric clinic showed a presenile cortical degeneration; in 7 circulatory disorder (arterio-sclerosis in 5) was found responsible for some of their incapacity. Dental carries, pyorrhœa and arthritis were recorded in isolated instances.

It has often been said that the repeated medical examination of hysterical patients fosters symptoms. No clear connexion between previous examination and any particular symptom could be demonstrated in this group, though 4 of them quoted gloomy prognostications by consultants who had seen them, and many recited their symptoms with a readiness and uniformity of iteration that bespoke practice, and perhaps also iatrogenic acceptance of their incapacity.

Intelligence

Careful psychological tests were not practicable: information was drawn from the alleged standard reached at school and from the psychiatric observations made at the clinic. The school record could not be verified, unfortunately, as the necessary official documents had not been preserved except for special schools. The following numbers may therefore be taken as minimal. Of the 52, 3 had attended special schools for the mentally defective, 13 others had not reached Standard 5 at school. On psychiatric examination 8 men were recognised as definitely defective in some degree: they had none of them been to school in the period subsequent to the passing of the 1913 Act, as had the 3 who were certified defective; if they had, several of them would probably have been certified. At the other end of the scale, 3 of the men were said to have won scholarships at the elementary school; none of them, however, had continued at school till sixteen; they had all done skilled work prior to the loss of their employment (engineer, grocer, petty officer). Only 12 men however had definitely reached Standard 7 or Ex. 7 by the age of fourteen. The proportion of people of poor intelligence here is higher than for the average population: the figures are, however, too small and incomplete.

Marital State and Children

All but 9 of the men are married. Their average age on marrying was 25½ years—i.e., two years less than Beveridge's figure for the general population. Eight were married before twenty, 18 between twenty and twenty-five, 10 between twenty-five and thirty. In 4, the marriage was definitely a failure (desertion cruelty, separation by consent). One could not be, sure whether others got on well together: in the majority it appeared to be tolerably so: many of the wives showed loyalty and affection, sometimes against heavy odds. The offspring of the 43 marriages numbered 221, of whom 182 survived. Well over a third of the children had been born since the first post-war application for out-relief. Of all the marriages, in only 16 cases had there been no addition to the family since going on out-relief. There were 8 instances where four or more children had been born after the patient had gone on out-relief;

objections to contraception here played a large part, as 4 of the men in question were Roman Catholics and others expressed their dislike of any precautions. The average number of children was six for men over forty, and four for men under forty. The unskilled had larger families than the skilled. The proportion is the same as was found for the previous generation of these families and shows also the fall in the birth-rate: the average figures for size of sibship to which the patient belonged were 6·8 for the skilled, 9·3 for the unskilled: the corresponding figures for his own progeny were 4 and 5·7. An eighth of the surviving children, belonging to sixteen families, have abnormalities, thus 7 are certified as mentally defective, 7 have neurotic habits (e.g., enuresis), 4 have chorea, and 2 are tuberculous. On the other hand 9 children, belonging to seven families, have won L.C.C. scholarships for secondary or central schools.

Of the 43 married men 40 have dependent children. This figure has been compared with those given in the New Survey of London Life and Labour, and with others specially collected for this purpose from 150 married men, depending on public assistance, who were attending an East London non-residential training centre in the spring of 1933. Making necessary allowances for differences in age distribution (for the majority of the non-neurotic married unemployed were ten years younger than the married neurotic men under consideration) it appeared that the number of dependent children was higher for the neurotic group than for other unemployed. (The figures are given in Miss Galloway's paper.)

Social Conditions: Housing, Food

It is not difficult in individual cases to see how neurosis and unsatisfactory housing conditions may interact, aggravating or maintaining each other. To generalise would, however, be unjustified. The general facts as to housing are that the men formerly in skilled trades now live in poorer quarters than they would if working. The overcrowding among these patients is greater than for the average population in these districts: the comparable figures were obtained from the London Survey (Eastern Area) and for details Miss Galloway's paper may be consulted. The conditions under which they live seemed in many instances conducive to ill-health. As regards food, the outstanding observation was that the standards varied over a wide range among families with comparable allowances, the determining factor being apparently the care and intelligence with which the family money was laid out on food and other necessities.

Treatment and Outcome

Psychotherapy, treatment directed mainly at physical illness, and occupation were the measures employed. They were recommended according to individual needs, on grounds which need not be particularised except as regards occupation. The mentally defective patients, the schizophrenic and epileptic were dealt with appropriately. Of the various therapeutic recommendations none was so frequently made as that of occupation. In 41 of the patients it seemed to the psychiatrist that regular occupation, such as might be obtained at a non-residential training centre, would be of benefit. This rested mainly on two assumptions: (1) that most of their present symptoms were responses to lack of occupation, and (2) that appropriate occupation is beneficial for most varieties of mental disorder, including that which these men showed. It was recognised, however, that there were practical as well as theoretical objections. Training centres are intended in the first instance for the more promising and healthy man, who has a greater claim upon them than the weakling who has inherent deficiencies of personality and adaptation. The opportunities for the neurotic men were therefore fewer, even if they were eager to avail themselves of them. But they had in the course of years come to have an overtly or subtly hostile attitude towards occupation in general and towards the training centres in particular which could more easily be understood on psychological lines than reversed by psychological treatment. It was therefore impossible to ensure that one's recommendations about occupation would in all cases be carried out: actually they were in more than a third of the cases.

It is difficult to estimate the benefit derived from the various forms of treatment, which were in many cases combined in the one patient. The most satisfactory criterion of improvement seemed the subsequent work-record. It was found on inquiry a year later that just over a third of the men had ceased to be recipients of out-relief, mostly because they had obtained work, and of the others, 5 had had intervals of remunerative work. It must be remembered that the remainder who had not been working included mentally defective, epileptic, insane, elderly, and physically unfit persons. It is of importance also to bear in mind the persistently adverse factors against employment. Many of these men are such as in the London Survey are designated "on the fringe of unemployability" and are held likely to get continuous work only in times of prosperity or expanding trade in their particular line. It was impossible to get from the patients or their wives useful indications of whether or not there had been improvement in symptoms and well-being.

Conclusions

These men are as much social as medical problems. The majority of them are evidently unable to support themselves; the grounds for this are not to be found only in the economic circumstances which are responsible for unemployment in the country as a whole. Their previous history and present state are evidence of inherent deficiencies of adaptation to their environment. In their present circumstances may be seen a continuation of the external factors which for the greater part of their lives have interacted with inherited predispositions to make them in various ways unsatisfactory. It is not from them that one can judge what effect long continued unemployment has on mental health: a series of men previously stable and well adapted must be examined if one would test and amplify the almost universal impression as to the harm it does. The group here dealt with had been selected because of mental deficiency or disorder of some sort which was associated with unemployment, and often indeed its chief cause. Their disability could usually be interpreted along the customary psychological lines, if one assumed a constitutional bias towards neurosis. As far as psychopathology was concerned, there was nothing to distinguish them from other patients, in every class and walk of life, who showed hysterical symptoms, anxiety, and irritability. The group was not quite homogeneous as to clinical picture, but if one excepted the few defective, epileptic, and insane patients, there was a considerable uniformity in it, and a close likeness to the syndrome of the chronic "compensation or pension-neurosis." It would seem that just as in mental hospitals where there was little occupation schizophrenic patients would tend to lose individual ifferences and outwardly approximate to a few ommon types, so persons with hysterical or other ypes of inadequacy tend, when long unemployed, o exhibit tremors, giddiness, anxiety, hypochondria, esentment, and depression as a fairly characteristic yndrome. They cannot by any means be taken as representative of the unemployed population. Whereas in the latter extraneous factors are mainly responsible for the unemployment, in the group here reported the prevailing economic difficulties seemed only contributory and, in some cases, negligible causes of their lack of work.

Deliberate prophylaxis of such disorders, whether it be genetic or individual, must wait on a better knowledge than we have at present of the essential factors in the causation of neurosis: very likely this end is served to some extent by the now widely available treatment of disorders of behaviour in children, and would be served also by measures of negative eugenics inculcated into, and observed by, psychopathic persons. However this may be, when one is confronted with such patients as these, treatment must be undertaken. It is almost impossible, when seeing these men or studying their individual histories, not to be impressed by the need for early recognition and treatment of their difficulties, before they have become inveterate, and by the need for controlled occupational therapy. Regular occupation with trained supervisors seems the most important requirement for their recovery: if conjoined with psychotherapy it is much more effective, but psychotherapy without regular occupation achieves little. Such a requirement may seem ideal, but it is already available for similar cases at the colony conducted by the Ex-Service Welfare Association, where its value has been proved. The problem of unemployment through neurosis is of course much larger than this, in which one has been considering only men on out-relief; the cost—and the gain—of providing adequate treatment cannot be assessed. But for such men as are here considered, the situation is narrower and simpler. The earlier they are given occupational therapy, with some measure of psychotherapy, the less unfit will they be to cope with their circumstances and the more likely to become socially self-sufficient.

SOME INTERRELATIONS BETWEEN
WATER AND FAT METABOLISM IN RELATION TO DISTURBED LIVER FUNCTION

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Since the "fatty liver" is a very important problem both for the clinician and the experimental pathologist working on questions of general metabolism we attempted to find a simple and rapid procedure by which such livers may be obtained in one of our most common laboratory animals, the rat.

A partial hepatectomy, in which 70 per cent. of the liver is removed according to the technique described in a previous paper, initiates compensatory hypertrophy of the remaining lobes but no fatty degeneration. Such animals, even though their general appearance is quite normal, remain in a state of hepatic insufficiency for some time; this was proved by the observation that the detoxication of such anæsthetics as Avertin, which are inactivated by the liver, proceeds at a very slow rate in these animals, while other anæsthetics, like magnesium salts, which are not detoxified by the liver, do not lead to longer anæsthesia after partial hepatectomy than otherwise.[1]

In a recent experimental investigation, designed to study the effect of the liver on diuresis, we availed ourselves of this method for the production of a state of partial hepatic insufficiency. (In all our experiments we used adult male rats weighing approximately 200–250 g.)

I.—In the first group 6 normal rats were slowly injected intravenously with an amount of an isotonic solution of sodium chloride equal to 10 per cent. of the body-weight. Their urine output during the first four hours following the injections averaged 12 c.cm., varying from 10 to 16 c.cm. Laparotomies performed at this time showed that no ascites or visible tissue œdema had formed under the influence of the injections. The urine output at the end of 24 hours following the injections averaged 24 c.cm., varying from 22 to 32 c.cm. At this time the animals were killed; they showed no ascites or œdema; the liver and thymus were of normal appearance.

II.—The second group consisted of 6 rats partially hepatectomised and then injected with the same amount of saline as the animals of Group I. The average urine output during the first four hours was 1·5 c.cm., varying from 0·7 to 2·5 c.cm., and the total output during the 24 hours following injections averaged 10 c.cm., varying from 2·2 to 14·5 c.cm. Laparotomy 4 hours after injection showed marked œdema, particularly of the pancreas and of the retroperitoneal tissue. At autopsy, 24 hours after injection, the tissue œdema was still very marked. The thymus was dark red and very œdematous in all these cases, and showed marked venous hyperæmia and numerous "Mastzellen" in its stroma upon histological examination. The livers of these animals showed marked signs of fatty infiltration, both macro- and microscopically. Frozen sections stained with Sudan III. showed that the fat granules were more or less uniformly spread over the whole lobule and had no focal distribution. The nuclei revealed no signs of degeneration.

III.—The third group consisted of 6 rats partially hepatectomised and injected with saline in the same manner as in Group II. The only difference was that the partial hepatectomy was performed 48 hours previous to the injection. Histological examination shows that 48 hours after partial hepatectomy active mitotic regeneration of the residual liver tissue is already well under way. At this time the ability to excrete water is also regained since these animals eliminated 16 c.cm. (variations from 13·5 to 22 c.cm.) of urine during the first four hours and 35 c.cm. (variations from 28 to 40 c.cm.) during the 24 hours following the injection and showed no œdema or thymus changes at any time during the experiment. Their livers were not fatty.

IV.—In the fourth group we followed the urine excretion of 6 partially hepatectomised and otherwise untreated rats and found that they excreted only 0·4 c.cm. (variations from 0·25 to 0·5 c.cm.) of urine during the first four hours after operation, and 6·2 c.cm. (variations from 4·2 to 10·5 c.cm.) during the 24 hours following hepatectomy. They showed no œdema or ascites at any time and their livers disclosed only very slight degrees of fat deposition after 24 hours. The thymus was normal in all these cases.

V.—In the fifth group, also consisting of 6 rats partially hepatectomised, we removed 5 c.cm. of blood through

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[1] Waelsch, H., and Selye, H.: Arch. f. exper. Path. Pharm., 1931, clxi., 115.

Group.	—	Urine output after—		Œdema after—		Ascites after—		Liver after 24 hrs.	Thymus after 24 hrs.
		4 hrs.* c.cm.	24 hrs.* c.cm.	4 hrs.*	24 hrs.*	4 hrs.	24 hrs.		
I.	Saline.	12 (10–16)	24 (22–32)	—	—	—	—	Normal.	Normal.
II.	Saline + hepatectomy. (Injection at time of operation.)	1·5 (0·7–2·5)	10 (2·2–14)	+	+	Trace.	Trace.	Fatty.	Œdema and hæmorrhages.
III.	Saline + hepatectomy. (Injection 48 hrs. after operation.)	16 (13·5–22)	35 (28–40)	—	—	—	—	Normal.	Normal.
IV.	Partial hepatectomy.	0·4 (0·25–0·5)	6·2 (4·2–10·5)	—	—	—	—	Normal.†	,,
V.	Partial hepatectomy + bleeding.	0·5 (0·0–0·7)	10·2 (11·8–13·0)	—	—	—	—	Fatty.	,,
VI.	Nephrectomy.	—	—	—	—	+	+	Normal.	Slight œdema.
VII.	Hypophysectomy + partial hepatectomy.	Not examined.	Not examined.	—	—	—	—	,,	Normal.
VIII.	Adrenalectomy + partial hepatectomy.	,,	,,	—	—	—	—	,,	,,

* The figures given are averages from the whole group. The numbers in parentheses represent the greatest variations observed.
† Or trace of fat deposition.

an injection needle inserted into the heart through the left jugular vein. The average urine excretion after 4 hours was 0·5 c.cm. (variations from 0 to 0·7 c.cm.) and after 24 hours 10·2 c.cm. (variations from 11·8 to 13·0 c.cm.). They never showed œdema nor ascites nor any thymus changes. Their liver was always markedly fatty. Six controls to this group showed that the removal of the same amount of blood does not produce fatty changes in the livers of normal rats with intact livers.

VI.—In order to see whether the tissue œdema and the thymus changes observed in Group II. were simply a result of the inability of such animals to excrete water, we performed bilateral nephrectomies on 6 rats and injected them with the same amount of saline as the animals of Group II. received. Four hours after injection they all showed much ascites but no trace of visible tissue œdema. Before the 24 hours were over, 3 of them died with severe ascites and such large quantities of pleural water accumulation that death was caused by lung atelectasis. The remaining 3 were sacrificed and also showed marked peritoneal and pleural water accumulations, but no pancreas œdema, and only slight thymus œdema. It seems obvious therefore that the tissue œdema observed after partial hepatectomy is not simply the result of defective water elimination.

We see that after partial hepatectomy the liver remnant shows marked fatty changes if the animals are bled or injected with large quantities of saline. In another series of 6 rats we were able to establish that the liver remnants show conspicuous fatty changes if the drinking-water be withdrawn from the animals after the operation. It appears therefore that any interference with water metabolism exerts a great strain on the relatively small liver remnant and causes fatty changes.

Since the removal of the hypophysis inhibits the fat deposition which is otherwise observed after pancreatectomy in the dog, we were interested to see whether it would also prevent the production of fatty livers under the conditions of the above experiments.

VII.—Seven rats, hypophysectomised months before the present experiments, were partially hepatectomised, and water was then withheld from them. They were killed 24 hours after hepatectomy, at which time only one of the seven showed a fatty liver and this one proved to be a partial hypophysectomy, in which the remaining piece of pituitary tissue sufficed to prevent adrenal and testicular atrophy.

This experiment suggests that the pituitary is essential for the deposition of fat in the liver. We wish to mention, in this connexion, that in 8 other rats, partially hepatectomised and hypophysectomised in one session, fatty degeneration of the liver remnants was not prevented. We deemed it possible that the inhibition of the fatty changes would not be observed until the adrenal atrophy developed.

VIII.—Six rats hepatectomised and deprived of water 24 hours after adrenalectomy seemed to confirm this view, since none of them showed fatty liver changes.

We feel that many more experiments will have to be done in order to clarify these strange interrelations between water and fat metabolism and the influence of the liver and of pituitary and adrenal hormones on them. In the present communication we merely wish to point out that such interrelations do exist. Experiments now under way in this laboratory are particularly designed to study the chemical aspects of this problem. The accompanying Table summarises our results.

COLOSTOMY AND ITS INHERENT DIFFICULTIES

A SUGGESTED OPERATIVE TECHNIQUE

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SURGEON TO OUT-PATIENTS WITH CHARGE OF RECTAL CLINIC, MIDDLESEX HOSPITAL, LONDON

Although the technique of colostomy has passed through three distinct phases, the ordinary procedure adopted in the operation to-day differs in no way from that followed by Duret [1] in 1793 in the first recorded successful case of sigmoid colostomy. Great interest was taken in this procedure, and in France it became known as the method of Littre,[2] who, as far as records carry us, was the first to suggest (1710) that this method of dealing with certain cases of imperforate anus might be possible in the future. As far as we know Littre made no attempt himself to carry out this suggestion.

The first deliberate formation of an artificial anus of which we have record, was made by Pillore [3] of Rouen in 1776, who, however, "chose the cæcum as that part of the intestine which was most fitting to fulfil my object," both by its situation, and because it would act as a reseroir and we should thus avoid a continuous and involuntary lischarge of excrements."

Callisen [4] of Copenhagen and Duret of Brest, investiated in the post-mortem room the possibilities of a lumbar olostomy, but each found that he had opened the perioneum in performing the operation, and accordingly ejected this route. Duret's observation on lumbar olostomy took place in 1793; the date of Callisen's bservation is not definitely known, but it is believed to be prior to that of Duret.

The situation as regards colostomy in 1797 is fortunately very clearly outlined for us by discussions [5] aroused in the Sociétés de Santé of Paris and Lyon following a timely paper by Dumas [6] of Montpellier, Observations and Reflections on Imperforate Anus.

In the first phase of colostomy, which lasted nearly fifty years after Duret's successful operation, Littre's method was used, and during that time the procedure was applied to a limited number of cases. The results in these cases were so unsatisfactory on the whole, the danger of interfering with the peritoneal cavity being as yet unsurmounted, that Amussat in 1838 dared not employ this remedy in the case of Prof. Broussais, who died of carcinoma of the rectum. Subsequent reflection on the subject impelled Amussat [7] to reinvestigate the possibility of lumbar colostomy. He found that it was possible to carry out this operation without opening the peritoneal cavity, especially when the bowel was distended as in obstruction, or was artificially blown up. He developed the technique and produced such good results as far as immediate mortality was concerned, that his operation came into general use and remained so during the greater part of the 19th century. With the introduction of asepsis and anæsthesia in surgery, a return was gradually made to the abdominal route now employed.

During the first phase a mesocolic stitch was not infrequently used, so that a satisfactory spur often resulted, although the importance of the stitch with relation to the spur had not been fully appreciated. A mesenteric stitch was the recognised procedure in cases of gangrenous hernia, being inserted to prevent the opened bowel from slipping back into the peritoneal cavity. Indeed, the spur most useful in colostomy proved most refractory in preventing the closure of the "anus contre-nature" developing from this delayed treatment of hernia. The problem of its treatment was finally solved by Dupuytren [8] in 1816, when he introduced his spur crusher, which still forms part of the equipment of every theatre and is used in the restoration of continuity of the colon after a temporary colostomy, or after a Paul's operation. In the second phase, with the lumbar colostomy, it was only possible to attach the bowel wall to the lips of the wound, so that a satisfactory spur was not obtained. Thus, in the third phase, with the return to the abdominal route, the importance of the mesocolic stitch was not definitely established, so that an unsatisfactory spur was a very frequent complication until Allingham Junr.[9] reintroduced the stitch as an essential step in the procedure.

One outstanding lesson to be learned from a review of the literature of the subject is the great inherent antipathy to this remedy. This is perhaps largely attributable to the miseries of the uncontrollable and inaccessible lumbar colostomy and to the prejudice handed down from that time.

As we have noted, the present-day operation is fundamentally the same as in 1793, and yet, by care in the performance, in the after-treatment, and in the training of the patient in the management of the colostomy, surgery has made tremendous progress in overcoming its disadvantages. So much so that a surgeon performing large numbers of colostomies may feel some surprise when he finds a patient whose prejudices persist after full explanation.

And yet the results are not so invariably good that they can be expected to overcome this prejudice entirely. Occasionally a patient is so comfortable with a colostomy that he is not prepared to submit to the small risk of closure even if advised to have this done. Frequently [2] a patient is so thankful to have escaped previous miseries that he rests content with a colostomy when he understands there is no escape from it. It may be assumed that in such cases the colostomy is well-behaved, that it requires little attention, and that the patient is so placed that what attention it does require is well within his power to give.

A considerable number of patients with colostomy, however, are far from content. These may be divided into two classes: (1) Those who are so placed that a colostomy life is possible if the colostomy is satisfactory. (2) Those who are so placed that the necessity for colostomy is almost inevitably a tragedy.

In the first group much may be done to relieve discontent by a suitable refurbishing of an unsatisfactory colostomy. The second group consists for the most part of men engaged in manual labour. In women doing housework it is generally possible whatever their status to arrange matters, but to a manual worker living in a congested area and working under the crude sanitary arrangements provided for some workmen during work hours, the prospect is unfaceable.

Inasmuch as the surgery of one generation may have found inexpedient a procedure quite practicable in the next, it is periodically necessary to review two questions, firstly, how the number of cases left with colostomy may be diminished, and secondly, how the technique and after-treatment may be improved to give a lower percentage of cripples and malcontents.

With regard to the first of these, many of these colostomies have been performed for cancer, some inoperable, others operable but involving the lower third of the pelvic colon down to the anus. Can any form of operation which will avoid colostomy be introduced with comparative safety with more careful selection in cases of low sigmoid or high rectal carcinoma? This question must exercise the minds of many who have reached the stage where the power to perform the accepted operations smoothly and confidently need no longer be regarded as the height of achievement. This matter is, however, outside the scope of this paper, the object of which is to deal with the second question.

It is proposed to consider here the best site for an artificial anus, the commonest ways in which such an anus becomes unsatisfactory, and to suggest a technique by which unnecessary defects may be avoided as far as possible.

THE SITE

A colostomy may be either terminal or subterminal. The terminal variety seldom has complications if reasonable care is taken in its construction, but the subterminal or loop colostomy is not infrequently far from satisfactory. For this reason some surgeons have tried the device of dividing the bowel, closing the distal end and dropping it back into the abdomen, so as to be able to use the proximal end as a terminal colostomy. This has the disadvantage of burying in the abdomen a partially obstructed and therefore probably infected loop of bowel. It is certain that the difficulties of the subterminal colostomy cannot be solved thus. If the bowel is divided the distal portion should most certainly be accessible for any washing out that may be necessary.

As noted above, the lumbar route was chosen in pre-antiseptic days because it gave access to the ascending and descending colon—usually the latter—which have no mesentery and could therefore be opened without peritoneal soiling, especially when the bowel was distended. Nowadays this site has nothing to recommend it. The operation is comparatively difficult to perform, a spur cannot be reckoned on, and the inaccessibility of the stoma for washouts and cleansing makes it intolerable from the patient's point of view.

As to general site then everyone is now agreed that if there is no possibility of retaining a controllable anus in the natural position, it is necessary to fashion an artificial, reasonably controllable one in an accessible situation. An abdominal colostomy is the only one that fulfils these conditions.

There is still some lack of unanimity as to the most suitable position for the sigmoid colostomy. The direct routes for the cæcum and the sigmoid lie through the right and left iliac fossæ. For the transverse colon the choice commonly falls on a muscle-splitting incision through the rectus. Indeed, so satisfactory has control by the rectus proved that this route has seemed to many surgeons in this country to be preferable even in the case of sigmoid colostomy. Recently, however, it has become more usual to adopt the obvious approach in each case.

The following reasons favour the inguinal route for sigmoid colostomy.

The opening is nearer the flank. It is therefore easier to close off completely the peritoneal space lateral to it and thus prevent all possibility of internal hernia here. It is further from any future mid-line incision. It is nearer the pelvis, so that if a purely perineal excision is performed subsequently there is less possibility of drag on the pelvic colon, and if the combined perineal and abdominal operation is performed, the bowel below the colostomy and the gap in the peritoneum can be more easily dealt with. Apart from these secondary considerations the layers of the abdominal wall in the left iliac fossa afford practical advantages for the actual colostomy.

In the muscle-splitting operation through the left iliac fossa the following demonstration of its advantage may be made during operation. A split is made through the aponeurosis of the external oblique and another is made in the deep muscles with its centre opposite the centre of the split in the external oblique. If the patient is now made or allowed to strain during the anæsthetic the hole in the deeper layer tends to be drawn laterally and sometimes quite clear of the split in the external oblique.

During strain, then, it may be argued that in an inguinal colostomy the gut traversing the muscle-splitting incision tends to be distorted as well as compressed, and an additional supporting factor is provided. The extent of this distortion varies with the distance externally from the rectus sheath.

In the incision through the rectus the hole through the abdominal parietes is compressed during coughing or straining but remains undistorted. This variety relies on muscular contraction, which in a carefully planned incision usually gives adequate control during straining.

FAULTY RESULTS

The method in which the colostomy is performed is of the greatest importance. There is no doubt that the simplest colostomy—an incision through the parietes just adequate for the loop to lie comfortably in each layer, with the loop held in position with a glass rod, and the bowel wall and skin so trimmed that the double-barrelled effect is not hooded by bowel wall or by skin—gives satisfactory results in the majority of cases, particularly if the operation area is properly supported after operation and no post-operative distension allowed to throw strain on this weakened part. In a recent paper Gabriel and Lloyd-Davies[10] survey the end-results of colostomy cases at St. Mark's Hospital and find that in 86 per cent. the function is satisfactory. These results are interesting inasmuch as the operations in this series have been performed by experts who have devoted considerable thought to the shortcomings of colostomies, and it may be assumed that the figures present a correspondingly favourable view of the end-results. A review of the results of colostomies throughout the country would probably be far more discouraging.

The following faults are the most common:—

1. *Retraction of spur.*—An essential of the satisfactory subterminal colostomy is the provision of a suitable mechanism for preventing fæces from entering the unused portion of the bowel. This mechanism may be furnished by the projection (spur) of the posterior wall of an incompletely divided bowel, or by some interposition of abdominal wall in a completely divided bowel. If the tissue intervening between the proximal and the distal stoma sinks below the surface of the skin, the mechanism fails, fæces pass into the distal stoma and further disability results from infection here, and possibly from fistula formation. In such cases the spur must be advanced, which may be a simple matter or may require an extensive repair of hernia.

2. *Stenosis.*—The tendency in a muscular aperture is to enlarge, especially under strain, but that of a skin opening is to contract, and stenosis of the skin in relation to colostomy is not uncommon. With stricture formation in the skin it may happen that the gut remains pouting, becomes œdematous and is obstructed in this way. More often as the skin contracts the bowel tends to recede into the subcutaneous layers. As the portion of bowel attached to the deep fascia remains more or less in situ, the intermediate portion pouches into the subcutaneous area, but such a pouch is of no disadvantage unless it is associated with skin stenosis.

In its worst form this stenosis with subcutaneous bulge may be regarded as a complication associated with simple rod colostomies that have been performed through inches of subcutaneous fat. The permanent spur is then only supported by a fibrous cord of scar tissue in the subcutaneous layer connected with the skin on both sides of the colostomy and passing through the mesentery where the rod lay. This support is somewhat inadequate in stout subjects, especially when the skin is tending to stenose around the stoma. The difficulty arises infrequently in thinner subjects, because the more closely the fibrous cord is related to the fascial external oblique the more stable the supporting mechanism.

This condition frequently calls for operation to remove the hood of skin, to enlarge the opening of the bowel and to stabilise the fibrous cord in relation to the deep fascia. The skin may be stitched to the deep fascia to prevent pouching. Owing to instability it is not infrequently associated with hernia and further treatment is necessitated for this.

3. *Hernia.*—In hernia during coughing and straining gut is flung en masse against a weakened portion of the fibromuscular wall which tends to give before it. The resulting bulge may be a small hemispherical one—when a little more of a loosely fixed colonic loop momentarily pushes through and recedes—or may be associated with a progressively enlarging pear-shaped hernial sac, similar to that in an ordinary incisional hernia.

4. *Prolapse.*—The causative factors in prolapse are accessory to those of hernia. In hernia the gut is flung en masse at the weak area during straining and coughing, but for a prolapse to result from such a strain it must happen that the colon adjoining the proximal or distal orifice is projected or forced end-on at a lax stoma, through which it protrudes. This obviously can happen most easily when the distortive action of the deep muscular layers is absent as in a "through the rectus" incision, or where the hole has been so constructed that the fibromuscular walls are very loosely apposed to the colostomy loop. This poor apposition of the fibromuscular layers means, therefore, that a potential hernia is present. In addition, the bowel prolapsed must be part of a loose loop or it could not prolapse. It is advisable, therefore, in performing the operation to draw down fairly tightly the upper loop which most often prolapses, but this not infrequently leaves the lower one lax. Indeed, in performing a colostomy with a view to subsequent radical procedures it is advantageous to leave the lower one as free as possible. To compensate for this laxity the abdominal wall may be left surrounding the bowel more firmly in the lower compartment.

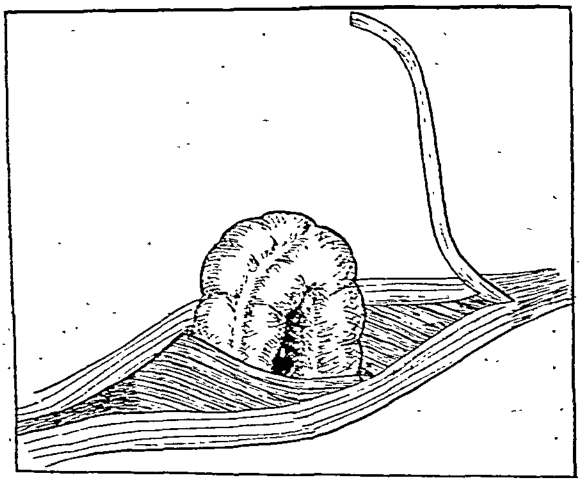

FIG. 1.—The deep muscles are supported with a silk suture.

Hernia, and also prolapse, are therefore best prevented by making the aperture in the abdominal parietes suitable in size from the beginning and preventing its enlargement. The hole should never take more than two fingers. It is unwise to attempt to enlarge for exploratory purposes the incision through which the bowel is to be brought for loop colostomy, in the belief that the hole can be satisfactorily reduced to the required size by careful resuture. Not only must the hole in the deep muscular layer not be made greater than is required for the actual colostomy, but also all possible measures must be taken to prevent it from stretching postoperatively.

The stress of a cough on a wound stitched up throughout its whole length is very small compared with that resulting when it is incompletely stitched so as to fit loosely around a loop of bowel. This loop becomes transformed in the act of straining into a wedge tending to increase the hole. Also favouring this increase a mild inflammatory process is likely to occur immediately after operation, sufficient to weaken the grip of the stitch partially closing such a wound, or to favour cutting-out. All precautions to ensure the resistance to herniation should be taken at the outset. If this resistance is adequate from the beginning all will remain well. If inadequate precautions are taken, the hole in the fibromuscular layer will undergo increase after operation, and at the end of convalescence there will be present an appreciable bulge which will tend to increase slowly with further activity. It must be remembered that all the surgeon has to do to increase the size of the opening obtained by muscle-splitting is to stretch further, and this stretching process is comparable to that which occurs under the force of coughing or straining.

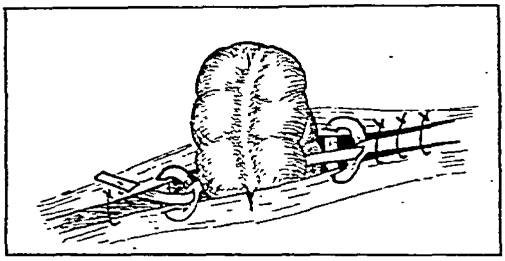

FIG. 2.—Method of suture of aponeurosis of external oblique.

SUGGESTED TECHNIQUE

The following technique is the one I have developed for use as a routine, after survey of the various possible methods. It aims at preserving the spur, preventing hernia, and diminishing the risk of prolapse.

A circular incision, diameter 1¼ in., is made by pulling up and shearing off the skin around a point 2 in. internal to and just above the anterior superior spine. This disc of skin and the underlying fat are removed and the aponeuroses of the external oblique exposed. The skin incision is enlarged up and down. A fascial strip just over ½ in. wide and 3½ in. long is then split off the external oblique. Externally, the strip is carried back parallel to the fibres as far as the muscle insertion, medially almost to the middle line (Fig. 1). Here it will be seen to consist of only one layer of the anterior rectal sheath. It is freed at its medial extremity. Retraction of skin is, of course, necessary in this procedure.

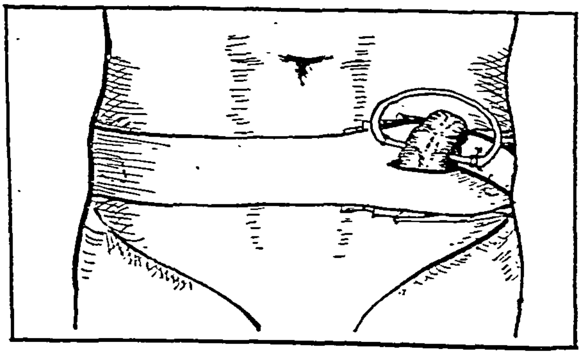

FIG. 3.—Strips of vaseline gauze surrounding colostomy are fixed by elastoplast strips carried round to back. The glass rod is stitched to the elastoplast. A second layer of vaseline gauze is now placed round the loop of bowel before this is opened transversely.

About the middle of the circular incision the deeper layers of the abdominal wall are then split for not more than 2 in. An incision admitting two fingers easily is made in the peritoneum.

The iliac or pelvic colon is sought and with due regard to the required tightness of the proximal loop a piece of tape is passed through the mesentery close to the bowel at a point suitable for colostomy. If the loop will not come up into the wound satisfactorily, the outer mesenteric fold and any adhesions reinforcing it are dissected up until there is no drag on the colon as it lies in the position required for colostomy.

The loop is returned to the abdominal cavity while further intra-abdominal examination is made. If considered advisable, a running suture is inserted to obliterate the peritoneal space outside the colostomy in which small gut might become trapped.

The colostomy loop is now withdrawn and the divided peritoneum approximated through the hole in the mesentery. The limits of the split in the deepest muscular layers are fixed with a No. 2 silk suture to prevent stretching here (Fig. 1). A Galley's needle is now applied to the fascial strip. It is carried through the edge of the divided external oblique at the selected point and locked, then through the mesentery, fixing the external oblique together on the inner side, locked and fixed there with silk (Fig. 2). Anterior and posterior to this locking suture the external oblique is sutured with catgut. Particular care is taken at the external angle of the rectus sheath. If either the upper or lower compartment of the hole through the external oblique appears tight, the lips may be notched until the desired size is reached. The lower compartment may be left tighter than the upper.

A rod is placed through the mesenteric hole superficial to the fascial strip, and the ends fixed by a complete loop of rubber tubing. In a very fat patient the rod and fascial strip should not both go through the same point in the mesentery unless the subcutaneous fat is excised over a wide surrounding area. In a fat patient the fat is stitched to the deep fascia to prevent the bowel bulging into the subcutaneous plane. The skin is then approximated round the bowel.

Two strips of vaseline or paraffin and flavine gauze are placed around the colostomy loop crossing under the rod on each side. If thought necessary, these are stitched to the skin at one or two points. The gauze is fixed in place by strips of elastoplast surrounding the wound, and these are carried round to the back as far as the lateral border of the erector spinæ on both sides to further support the weakened area. The glass rod is sutured to the surface of the elastoplast to prevent movement. The bowel is next covered with a layer of vaseline lint, a small hole is cut in this, and the bowel is opened transversely with a cautery. Any gross mass of fæces is removed. The stoma is covered with vaseline gauze. Delay in opening the stoma often results in a great measure of discomfort to the patient. On the following and subsequent days, the dressings may be taken down as far as the elastoplast, and at any time an ounce or more of paraffin may be injected into the proximal stoma through a catheter. Later, the colostomy is well trimmed back, as any redundant peritoneal covered bowel left exposed will recede into the subcutaneous area, tending to drag back the spur and also to form a pouch.

NOTE.—A similar technique is used for colostomy through the rectus sheath, the anterior sheath of which affords an excellent strip.

Repair of unsatisfactory colostomy.—In repair of a colostomy for hernia or retracted spur the fascial graft is also used.

The colostomy loop is freed from the skin and the layers of the abdominal wall are defined and freed from each other and from the peritoneum, which is not opened. The colostomy loop is now pulled forward together with the peritoneum, and cholecystectomy forceps are worked round the bowel. This can usually be done without opening the peritoneum. Through the hole a supporting fascial strip and a temporarily reinforcing rubber tube are to be passed. A fascial strip is taken from the external oblique on one or other side of the colostomy, if this seems suitable. If the hernia is large, the musculature weak, the external oblique will probably be unsuitable for a graft, and a long strip from the thigh is taken. The deep muscular layers of the abdominal wall are sutured closely round the loop. The fascial strip from the external oblique or from the thigh is then used to suture the external oblique and to reinforce the spur, as in the operation described above. The remaining procedure is as already outlined. If there is a bad degree of prolapse, it may be necessary to amputate this subsequently.

In developing this technique I used the fascial strip method first with the route through the rectus. I found it always adequate as regards spur maintenance, but occasionally slight hernial bulging developed, because the hole in the posterior rectus sheath tends to get bigger, and in one or two of these cases there was a slight tendency to prolapse. The use of the inguinal route combined with a stitch support of the deep layers is, however, most satisfactory.

The anatomy of this region lends itself readily to this method of dealing with the special mechanical difficulties that are inseparable from the establishment of a satisfactory abdominal anus. The fascial strip cross-ties and firmly supports the fibromuscular aperture in the diameter which is usually the widest and weakest, and no other form of suture affords the same measure of security. I have therefore ventured to put the method on record in the hope that some of the suggestions may be of service to those who have not yet standardised their technique to their own satisfaction.

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Clinical and Laboratory Notes

BILATERAL ZOSTER AND ZOSTER VARICELLOSUS

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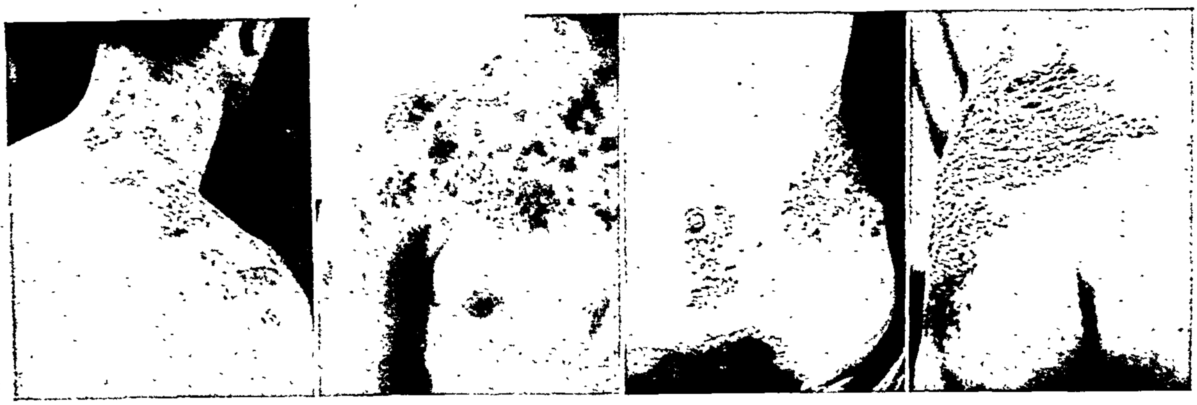
THE apparent rarity of bilateral zoster makes this case worthy of record.

A man, aged 21, a packer of wireless cabinets, attended the London Hospital with a typical zoster eruption of the right shoulder, left loin, and abdomen. Five days previously he had noticed irritation of his left buttock and loin. Shortly afterwards he noticed the eruption in this situation. The next day he noticed irritation of his right shoulder and a similar eruption appeared. At the same time scattered spots appeared over his trunk. He gave no history of previous illness and he had never had chicken-pox or zoster.

When he was first seen five days from the onset of the eruption, there were groups of vesicles and bullæ containing slightly turbid fluid grouped on an inflamed base in the areas of distribution of the right third, fourth, and fifth cervical nerve-roots and the left dorsal tenth, eleventh, twelfth and first and second lumbar nerve-roots as shown in the accompanying illustration. In addition he had a sparse eruption of scattered discrete pinhead vesicles on erythematous macules distributed on the back, chest, abdomen



Photographs showing the site of the zoster lesions.

and buttocks. All the vesicles were in the same phase of evolution and differed in this respect from the lesions of varicella. The right axillary and the left inguinal lymphatic glands were enlarged.

The patient's temperature was 100° F. and the pulse-rate 88. Physical examination revealed no abnormalities. The patient felt well and complained of no subjective symptoms except slight burning and irritation. He was treated in bed and given sodium iodide grs. 10 t.d.s. by the mouth. A dusting powder was applied to the vesicles. The vesicles rapidly dried up and he developed no post-herpetic pain.

Serum collected fourteen days after the onset of the eruption gave a positive complement-fixation reaction with a vesicular antigen from another case of zoster.

My thanks are due to Dr. W. J. O'Donovan for permission to publish this case and to Dr. R. T. Brain for the information about the complement-fixation reaction.

DYSOSTOSIS CLEIDOCRANIALIS

SHOWING UNIQUE SCAPULÆ OF PRIMITIVE TYPE *

By Victor J. Kinsella, F.R.C.S. Eng.

Dysostosis cleidocranialis is a developmental deficiency of the skeleton affecting chiefly the clavicles and the bones of the cranial vault. It is complementary to achondroplasia, in which the cartilage bones bear the brunt of the disorder.

Its interest lies firstly in its rarity. Although it was described as long ago as 1766, a careful review of the literature in 1908 by Hultkrantz revealed only 31 cases described clinically. There are a few other cases in which reference is made to either the clavicle or the skull alone. In the museums of the world there are only nine skulls showing the condition, five of these being in the institute of pathological anatomy of the University of Vienna. This institute contains also the skeletons of two cases—I believe the only two in existence. Efforts have been made by other institutions to obtain some of this material, but even in their days of tribulation, the Viennese preserve their sense of relative values and their museums retain their treasures.

The second source of interest is the light which this condition is said to throw upon the development of the clavicle, the first bone in the human body to ossify. In the embryonic clavicle, cartilage cells and afterwards osseous tissue make their appearance in a peculiar precartilaginous condensation of the mesenchyme. Seeing that in cleidocranial dysostosis the clavicle suffers along with the bones of the cranial vault, the clavicle itself has been looked upon as being partly a membrane bone. But as we shall see in the case which I am presenting, interference with growth in cleidocranial dysostosis may be found also in bones developed in cartilage—e.g., the scapulæ and phalanges of the foot.

A third point of interest is that the possible development of the clavicle in two parts complicates the attempt of morphologists to recognise in the human shoulder girdle the two ventral elements of the primitive pectoral girdle, the coracoid and precoracoid, which are seen in some of the lower animals, and which correspond with the pubis and ischium of the pelvic girdle. In the fruitless controversies over this question almost every possible combination has been made to represent the primitive elements from among the centres of ossification of the coracoid process, the clavicles, the metacromion, the suprasternal bones, and the various ligaments around the clavicle (costoclavicular, coracoclavicular and costocoracoid and the articular disc). Some morphologists

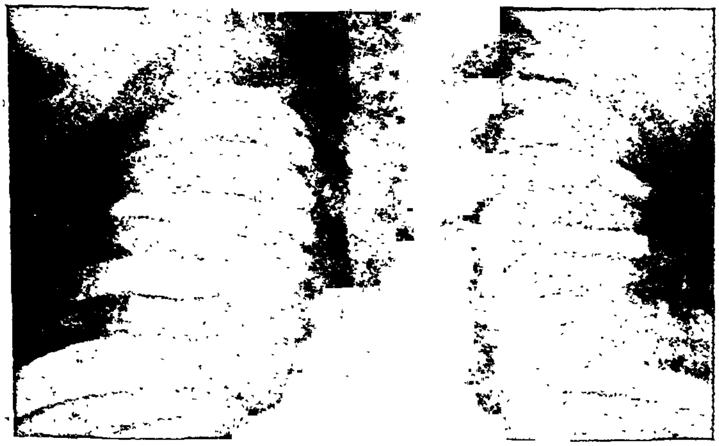


FIG. 1.—Radiogram of chest showing abnormality of clavicles.

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* Communicated to the Royal Prince Alfred Hospital Medical Officers' Association, Sydney.

deny that the shoulder girdle has any pubic representative.

The patient who came under my care is a boy of 16 years. He is of slender build and with more than average intelligence, features noted by Paltauf in his case. His parents relate that the anterior fontanelle closed very late. In many cases a strong hereditary tendency has been noted, but clinical examination of the parents of this boy and X ray examination of their hands revealed no abnormality, and no relevant point could be elicited in the family history. A large number of the cases described are of French extraction, as was pointed out to me by Dr. Sear, but the parents of my patient knew of no French blood in their families.

The patient was almost able to approximate his shoulders across the front of his chest. On palpation absence of the acromial end of each clavicle was noted. The sternal ends tapered laterally to a point. These bones can be seen in the radiogram in the upper part of the lung field, and their radiographic density is much less than that of the ribs. They are no doubt very soft and deficient in lime salts (Fig. 1). From the under surface of the pointed extremities a thin cord passed laterally to the shoulder regions. Whether these cords were attached laterally to the coracoid or acromion or to some other part could not be definitely determined, but they probably represent the coracoclavicular ligaments (or thickened upper edge of the costocoracoid membrane). The clavicular parts of the deltoid and pectoralis major muscles were poorly, if at all, developed. The patient complained of no disability associated with the condition of his shoulder girdle; on the contrary, he played such games as tennis with ease. Absence of the acromial end of each clavicle, as described above, is the commonest type of clavicular abnormality met with in these cases. The next most common arrangement is replacement of the middle portion by a fibrous band which unites the acromial and sternal extremities.

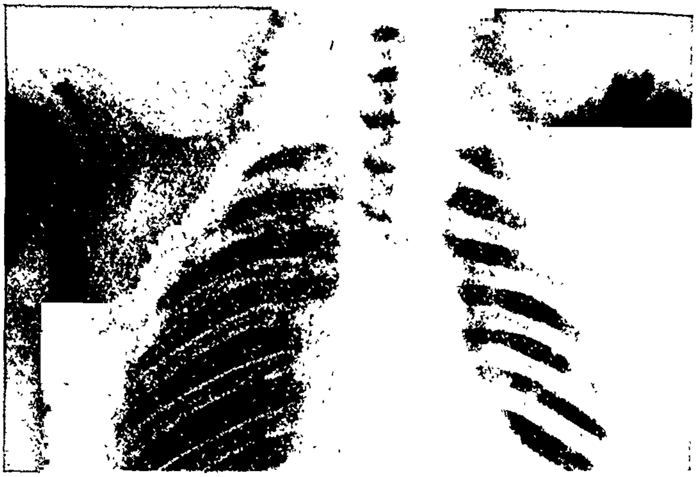
FIG. 2.—Radiogram showing abnormality of scapulæ.

Fig. 2 shows an apparent absence of the supraspinous fossæ of the scapulæ, the spine and acromion springing directly from the upper border, an arrangement rather similar to that found in the iguana and platypus. I cannot find reference to such a malformation in any other case. I am indebted to the director of the pathological anatomical institute of the University of Vienna for a personal communication, wherein he informs me that there is no such abnormality in the scapulæ of the two skeletons in the institute.

The skull in this patient shows the features usually described—a large cranial vault, small and narrow base, small facial bones, metopic suture, wormian bones in the neighbourhood of the lambda, high vaulting of the palate, and marked delay and irregularity in the eruption of the teeth. The erupted teeth were stunted and all were milk teeth, except three premolars and one canine. The remaining second teeth were still unerupted. The dental surgeon is at present exercised to provide an efficient masticatory apparatus, and proposes the removal of the erupted teeth and the use of prostheses. Dr. Sear has drawn my attention to an increased density along the suture lines in these radiograms, a feature already noted in cases seen by him.

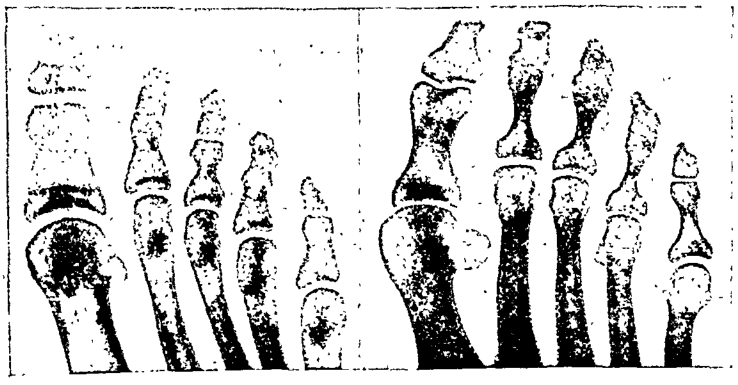
FIG. 3.—Radiogram of the patient's toes (left-hand photograph) compared with those of a normal person.

Radiograms of the toes are illustrated in Fig. 3 together with those of a normal person of about the same size but three years older than the patient. Note the shortening of the phalanges (already described by Murk Jansen) and the more open texture of the cancellous bone and deficient development of the compact bone. The phalanges of the hand show similar features in lesser degree. The index metacarpal is very long and shows an epiphysis at each end.

There were also noted a marked scoliosis, with lower limbs of equal length, bilateral cervical rib, club-feet corrected by operation in infancy, and changes in the pelvis. The narrowing of the pelvis, especially of the ilium, and the gap in the region of the symphysis pubis have already been noted, as by Paltauf.

For further accounts of cleidocranial dysostosis, and of the various speculative questions associated therewith, the reader may consult articles by Fitzwilliams[1] and Paltauf.[2]

PEPTIC ULCER IN A SOLOMON ISLAND NATIVE

By Clifford James, M.B. N.Z., F.R.C.S. Edin., D.T.M. & H.

It has been said that peptic ulcers are "confined to men of civilised races living in temperate climates,"[1] and the following case may therefore be of interest.

I had started medical work in a native-built hospital on Choiseul, the island lying at the north-western extremity of the British Solomons Group, and the most out-of-the-way of the larger islands. The latitude is 7° South, and the climate hot and moist. Organised fighting had ceased about ten years before. The wildest part of the island was on the Vurulata River, and from this region came my patient.

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[1] Fitzwilliams, D. C. L.: THE LANCET, 1910, ii., 1466.

[2] Paltauf, R.: Verhandl. d. Deut. path. Gesells., 1912, xv., 337.

[3] Ogilvie, W. H.: THE LANCET, 1935, i., 419.

Qoqoro, a male native aged approximately 27 years, small in build, sturdy, but undernourished, was brought by his relatives because they said that he would die if left in his village. He was becoming thin. He himself said that he had pain in his abdomen, and "while his mouth wanted to eat his stomach would not let it eat." When he ate, it caused pain, and so he did not eat. Eating was followed by vomiting which gave relief.

On examination, he was obviously thin. He put one finger on a spot in the epigastrium to the left of the mid-line, and pressure there caused pain. It was quite localised. His spleen was enlarged to a point half way between the costal margin and the umbilicus, being due to malaria which is universal throughout the island. He also suffered from yaws as evidenced by the worm-eaten appearance of the soles of his feet; yaws also is universal. His mouth was red from the betel-nut which he was chewing, and his gums showed evidence of pyorrhœa which also is very common.

As malaria is the cause of most epigastric trouble in these parts, he was admitted to hospital and treated with quinine, and iron tonics. He received weekly injections of neoarsphenamine for his yaws. But while his malaria was much improved, and his yaws was cured, he still complained of his pain. A diagnosis of peptic ulcer was made. A mixture containing bismuth and sod. bicarb. relieved his pain, but considering the patient and his food and mode of life, a cure from medical treatment was not to be expected. The place we called the "theatre," and the staff consisting of one white nurse and one orderly, newly arrived from the bush, made surgical treatment also rather an unknown quantity.

Under rectal ether with some chloroform on a mask as required, a laparotomy was done, and on the anterior wall of the stomach very near the lesser curvature, and about 2 inches from the pylorous, an ulcer was found and demonstrated to the nurse. It was round, with a definite edge moderately hard, and the crater admitted the tip of my little finger. Some adhesions stretched from the peritoneal surface of the base of the ulcer to the liver. A posterior gastro-jejunostomy was done and the incision closed. He passed tarry stools for three days, but thereafter his recovery was uneventful and rapid. He was put on to alkalis. He gained rapidly in weight, so much so that his scar was stretched to an inch in width. When I saw him two years later he had put on 2 stones in weight, had no pain, and was thoroughly satisfied with himself. He had not needed to work because the story of "how we did it" would always secure him a meal.

While this complaint cannot be common, its frequency is difficult to estimate. These people are used to disease, and consider such things as fever and yaws as part of their normal lives. It was only the severity of the symptoms of the above case which made him come for treatment. Those with less discomfort would not come. Anæsthetics and operations were a very new thing and to be avoided if possible.

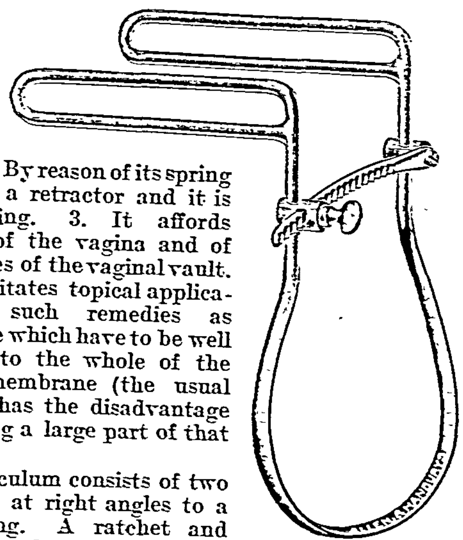
Amongst these people, furthermore, there are factors which would predispose to peptic ulceration. Malaria causes anæmia and a generally lessened resistance to disease. Ulcers occur in other sites, particularly the skin, with the greatest of ease. Their food is coarse, mostly vegetable, and consists of taro, yam, sweet potato, banana, tapioca, and—in times of stress when the gardens are poor—coconut, which is poorly chewed, and is swallowed in lumps. All their foods are insufficiently masticated. Chewing is a waste of time. Their meals are often huge, and are taken at more or less irregular intervals. The diet is unbalanced, and except for a little fish is of necessity vegetarian. Pyorrhœa as has been stated is very common, the gums exuding pus, and the teeth becoming prematurely loosened, and dropping out. Malaria, while lessening the resistance of the patient, also damages the lining of the stomach. The subtertian parasite, by sporulating in the gastric vessels, causes congestion, thrombosis, and subsequently bleeding into the stomach.

On the other hand, the malaria which does the damage to the blood and to the stomach also lowers the gastric acidity, as many as 26 per cent. of patients having achlorhydria. While pyorrhœa is so common, caries and apical abscesses are rare, and correspondingly, bacteria in the blood from that source are rare also. Nasal sinus involvement is not uncommon, but septic tonsils are not common. Betel nut is also a factor. This nut is most unpalatable if taken alone, but when combined with lime it loses its acridity, turns red, and becomes palatable. The amount of lime that is used is considerable, and while a good deal is ejected, as with tobacco-chewing, a fair amount must be swallowed. These folks are not heavy smokers, as the white man considers smoking, but they are much subject to cold and damp. Few have blankets, and most spend the night lying alongside a small fire, which is renewed when the chilliness has awakened the sleeper.

NEW INVENTIONS

SELF-RETAINING VAGINAL SPECULUM FOR TOPICAL APPLICATIONS

THIS speculum which is in use at the Tuckingmill Venereal Diseases Clinic serves the following purposes: 1. It is readily introduced into any sized vaginal orifice. 2. By reason of its spring it acts as a retractor and it is self-retaining. 3. It affords full view of the vagina and of the fornices of the vaginal vault. 4. It facilitates topical application of such remedies as urochrome which have to be well rubbed into the whole of the mucous membrane (the usual speculum has the disadvantage of covering a large part of that surface).



The speculum consists of two blades set at right angles to a bow spring. A ratchet and screw fixes the blades in position after insertion. The blades are four inches long and three-quarters of an inch wide, but fenestrated.

The instrument has been made for me by Messrs. Allen and Hanburys, Ltd., Bethnal Green, E.2.

C. H. RIVERS, M.D., M.R.C.P. Lond.

NEW WESTMINSTER HOSPITAL.—As a precaution against flooding the new medical school and nurses' home at this hospital are to be built on a typical old Thames site. The basement will be a great watertight concrete-asphalt tank nearly 100 yards long, 30 yards wide, and 5 to 7 yards deep. Nearly 200 concrete blocks placed over the floor of the tank will support main stanchions on which the building will rise to a height of over 100 feet from the basement level to the motor-house on the flat roof.

REVIEWS AND NOTICES OF BOOKS

Epidemics and Crowd Diseases

An Introduction to the Study of Epidemiology. By MAJOR GREENWOOD, D.Sc., F.R.C.P., F.R.S., President of the Royal Statistical Society; Professor of Epidemiology and Vital Statistics in the University of London and London School of Hygiene and Tropical Medicine. London: Williams and Norgate. 1935. Pp 410. 21*s*.

THIS book is unique in its approach, the emphasis, as indicated in the sub-title, being laid on the *study* of epidemiology. Prof. Greenwood traces the evolution of ideas on the subject, the part played in these developments by workers in the past being described in a way which captures at once the reader's interest and attention. The book will be found of little value for examination purposes or as a work of detailed reference; it contains no ordinary descriptions of notifiable infectious diseases arranged under the customary headings of incubation periods, infecting organisms, predisposing factors, differential diagnosis, age and sex variations of incidence and fatality-rates, prophylaxis, and treatment. But the reader will gain from it some idea of the methods of approach to the general problems of communal medicine, and—perhaps more important—he will begin to realise something of the vital interest and importance attaching to the skilful analysis of masses of statistical data and the intelligent synthesis of the findings. The author builds upon solid foundations, e.g., the futility of speculation as a means of arriving at the solution of problems, the realisation of the need for basic data, the practical necessity for new and more appropriate technical methods of analysis, and, finally and fundamentally, the application of the principles of ordinary logic to the results. The teaching is clothed in his usual lucid and pungent style.

Prof. Greenwood traces the evolution of epidemiological thought from the times of Hippocrates and Galen, through the age of Graunt and the dawning of interest in the collection and analysis of mass statistical data, to those more recent times in which the knowledge of bacteriology and technical methods of examining data have assisted so materially in the approach to epidemiological problems. In spite of such advances in knowledge and technique, the failure to elucidate the fundamental laws of epidemiological visitations in human experience and the realisation of our essential ignorance of the grammar of the subject ("human populations," the author says, "will not stay put") led to the latest development of investigation upon the simpler and more easily controlled populations of lower animals—an advance with which the author's name is intimately connected. These introductory chapters depict the giants of the past with illuminating sidelights on their personalities, and afford a clear view of the stagnation and periodical spurts in the general advance of knowledge along this path. Three chapters on predisposing factors in communal sickness — nutritional, occupational, and psychological—round off the general part of the book. Representative groups of "crowd" diseases are then dealt with historically and descriptively. Classical epidemics, their investigation, and the reasons for the conclusions reached, are instanced, and the problems of the statistical epidemiology of each discussed, the whole exposition indicating what can be learned of the crowd from this point of view, and how such learning is to be attained. A departure from the usual conception is the inclusion in the discussion of such diseases as tuberculosis, cancer, and venereal disease.

The volume is a contribution to the science of epidemiology which will command earnest and thoughtful study by all students of human health.

Gastritis and its Consequences

By KNUD FABER, M.D., F.R.C.P.E., Hon. Professor of Internal Medicine in the University of Copenhagen. London: Humphrey Milford, Oxford University Press. 1935. Pp. 119. 8*s*. 6*d*.

Prof. Faber has for so long been the champion of that school which emphasises the importance of gastritis that he may well look upon the present decade as one of triumph for his views. Gastritis excites more and more interest in the medical world; it is one of the principal subjects chosen for discussion at the International Congress on Gastro-Enterology being held in Brussels during this week, and the increasing popularity of gastroscopy has added a vast amount of new information on the subject. In this book, which is based on three lectures given at Guy's Hospital in 1934, Prof. Faber summarises his ideas on the whole subject. Many beautiful low and high power microphotographs are included, and the monograph provides strong evidence in favour of his main thesis, which is that gastritis is such a common disease that it is very rare for a normal stomach to exist in an adult person. From this thesis the author goes on to develop the theme that gastritis is a very important ætiological factor in the production of peptic ulcer, and later that gastritis is the all-important cause of anacidity. His inquiries at the University Clinic, Copenhagen, do not support the view of A. F. Hurst that hyperacidity and anacidity are largely a matter of diathesis; he believes that inflammatory disease rather than any inborn or constitutional factor is the important cause of anacidity and hence of pernicious anæmia. As regards cancer of the stomach, on the other hand, he believes that a constitutional or hereditary disposition is of greater importance in ætiology than the presence of gastritis.

This monograph, from one who is, perhaps, the principal exponent of the "gastritis" school, does not impress as entirely convincing. Many lacunæ remain to be filled up before peptic ulcer and pernicious anæmia can logically be placed in the same pigeon hole. The evidence as to the frequency of gastritis is certainly striking, but its acceptance carries with it the corollary that gastritis if very common must often be symptomless.

Diabetes Mellitus and Obesity

By GARFIELD G. DUNCAN, M.D., C.M. (McG.), Associate in Medicine in the Jefferson Medical College, Philadelphia; Assistant Physician to the Pennsylvania Hospital; Chief of the Metabolic Clinic of "B. Service," Pennsylvania Hospital. London: Henry Kimpton. 1935. Pp. 215. 12*s*. 6*d*.

Dr. Duncan, who worked at one time under Dr. F. M. Allen, has written a book which will be very useful to doctors looking after diabetic patients. The physiology and pathology of the disease are clearly described, and the way the diet is arranged is fairly simple, though the food value of vegetables, fruit and so forth are given in percentages instead of in the much more convenient five gramme method. The instructions for the care of the feet, in order to reduce the risk of gangrene, are very detailed and contain much valuable information. The differential diagnosis between coma due to hyper and hypoglycæmia is very well set out, and stress is laid on the necessity of getting rid of the ketones in diabetic coma as soon as possible. This is accomplished by giving glucose as well as insulin at frequent intervals. A simple way of testing for the presence of acetone bodies in the blood by means of the Rothera reagent is described.

The second part of the book (41 pages) is devoted to an interesting account of obesity. It is estimated that one-fifth of the population of the United States is overweight, and that diabetes is ten to twenty times as frequent in fat people than in those of normal weight. According to this, then, the prevention of diabetes in the elderly people depends largely on the reduction of the number of people who are overweight. A succinct account is given of the causes of simple obesity where no endocrine disturbance can be made out, and the relation of heredity, age, race, sex and occupation. The principles on which a reducing diet is constructed are clear, stress is laid on the importance of not reducing the calories provided by the carbohydrate below one-third or half the total calories of the diet. The specific dynamic action of protein is of little value in increasing the metabolism of the foods in obesity, and it is unnecessary to give large amounts of protein. The fat can be reduced to a small amount. The foods which contain low, moderate and high calories are given in three parallel columns. They do not seem well adapted for the purpose of enabling the patient to choose a diet containing the correct balance between carbohydrate, protein and fat. Some useful tables are appended.

Growth and Distribution of Population

By S. VERE PEARSON, M.D., M.R.C.P. London: George Allen and Unwin. 1935. Pp. 448. 12*s*. 6*d*.

THE main theme of this book is that the proper growth and the rational distribution of population has been hampered throughout the ages by the private ownership of land. The indictment of landlordism is powerful, and the unbiased reader will be impressed with the evils inherent in a system which allows a man through no effort of his own to profit greatly when he happens to own a site which the efforts of the community have made valuable. Dr. Pearson's survey of land tenure extends historically from neolithic times to the present, and geographically from the swamps of Central Africa to modern New York. The remedy suggested is that the ownership of the land should revert to the community (with suitable compensation to landlords in particularly hard cases); rent would then become payable direct to the State and would be sufficient in amount to make other forms of taxation unnecessary. If free access to land were available the author considers that this country would support a rural population, about three times as numerous as at present, who would devote themselves to the intensive cultivation of the land.

In addition to landlords, Dr. Pearson detests contraceptives and water-closets. In the ideal world which he visualises the former would be made unnecessary on account of the greatly increased population which properly used land would support, and these teeming millions would increase the fertility of their fields with the contents of earth-closets from which some fastidious Chinaman had taught them to eliminate all traces of smell. It is also claimed that the abolition of the landlord, by giving the common people free access to land, would cure unemployment and abolish war. It does not require a statistician to perceive that the alternatives of birth control or civil war would arise after a time in any such community, though the calculation of the period during which peaceful expansion would be likely to endure might be difficult even for experts. Not many of Dr. Vere Pearson's readers will share his faith, but all will find stimulus as well as much information in his pages. For a physician who has reached a prominent position in his own branch of medicine to find the time and surplus energy to tackle so difficult a problem of sociology is in itself no mean achievement.

Dietetics for the Clinician

Second edition. By M. A. BRIDGES, B.S., M.D., F.A.C.P., Director of Medicine, Department of Correction Hospitals; Consulting Physician, Seaview Hospital, New York. London: Henry Kimpton. 1935. Pp. 970. 45*s*.

THIS book contains a wealth of information on dietetics which will be valued by English readers. The opening section on the mechanics of digestion is so condensed as to be of small value, but the following chapters, dealing with physiology, vitamins, and the composition of foods, are well written and up to date. The later chapters of the book dealing with the treatment of various diseases by diet contain the views of well-known American authorities such as H. O. Mosenthal, H. W. Blake, and N. T. Saxl. The description of the dietetics of each disease is preceded by a brief description of the pathology and clinical manifestations which is usually very well compiled. It is to be regretted that the differences between British and American menus robs this excellent volume of much of its utility for the English practitioner. The book ends with thirty pages of bibliography and excellent indices.

Pharmacological Action of Harrogate Drinking Waters

By WILLIAM BAIN, M.D. Dunelm, F.R.C.P. Lond., F.R.C.S. Edin., Editor of "A Text-book of Medical Practice." London: J. and A. Churchill Ltd. 1935. Pp. 53. 5*s*.

IN this little book Dr. Bain presents the results of his investigations of the pharmacological action of a number of the waters obtainable at the Harrogate spa. These fall into two main groups, the sulphur and the iron-containing or chalybeate waters, each of which can be further subdivided according to the tonicity of the water compared with the body fluids. His experiments show that on an isolated strip of the rabbit's intestine most of the waters cause an increase in movement with, in some cases, an increased muscle tone, while the intravenous injection of many of the sulphur waters into a pithed animal results generally in an increased movement of the stomach and intestine, and an increase in the tone of the pyloric and ileocolic sphincters. The chalybeate waters have no such effect. His observations on the cholagogic action of the waters lead him to the conclusion that the old sulphur spring water increases both the quantity of bile and the bile solids, while the strong Montpellier spring water diminishes them slightly. On the isolated rabbit's heart the chalybeate waters produce an increase in systolic contraction and cardiac output, and in the intact animal his experiments suggest that the effect of a mild isotonic sulphur water is to relax the cardiac muscle without any change in cardiac amplitude or blood pressure.

These experiments are interesting, but it is a little doubtful if they warrant the conclusion drawn by the author that Harrogate ought to specialise and concentrate upon two different sets of diseases, viz., affections of the alimentary tract, including the liver, and diseases of the heart. It is difficult to be sure that waters given, as they usually are, by mouth will produce the same effect as they show on isolated tissues or when administered intravenously, and it is by no means certain that an increase in the flow of bile is of much therapeutic importance in most diseases of the liver. In any case, the most powerful known cholagogue, bile itself, is always available. But any serious attempt to lend precision to spa treatment by exact pharmacological experiment is to be welcomed, and we commend Dr. Bain's book to the attention of those interested in the future of our spas.

Pflanzliche Therapie

By Dr. ERNST MEYER, Oberarzt der Inneren Abteilung des Städtischen Krankenhauses, Berlin-Spandau. Leipzig: Georg Thieme. 1935. Pp. 202. R.M. 4.80.

THIS little book deals with the treatment of disease by the internal administration of drugs obtained from plant sources. It attempts to revive interest in the galenical preparations, and may serve a useful purpose on the continent in drawing attention to the fact that drugs may usefully be given by other routes than by intravenous and subcutaneous injection. The first part of the book provides an interesting review of the history and development of plant therapy. In the second part the author deals systematically with the applied pharmacology of plant extracts, while in the third he gives examples of prescriptions classified according to disease of the various systems. While to the ordinary reader many of the drugs advised may be unknown, and the rationale of the use of others be in doubt, the specialist will find the book of considerable value.

A Doctor Talks

By JAMES MCDONNELL, M.C., M.R.C.S. Eng., L.R.C.P. Lond. London: George Newnes Ltd. 1935. Pp. 126. 5s.

THE author's excellent purpose is to persuade the patient to go to his doctor for a diagnosis rather than to the chemist for symptomatic treatment. The style is simple and colloquial; the standard of erudition demanded of readers rather lower than that in a first-aid manual. The hypochondriac, only too often an amateur doctor, will not be satisfied with such elementary stuff and the general public will only find herein that little knowledge which is a dangerous and alarming thing. Dr. McDonnell is at pains to point out that he is not trying to "put the wind up" the reader but at the same time adjures him to make a business of his health—surely redundant advice in this neurotic age. "Fouet's" little humorous sketches are attractive and recall those of Mr. Reynolds in "1066 and All That."

Quarterly Journal of Medicine

IN the July issue (vol. iv., new series) J. S. Westwater (London) gives the results of his study of tuberculin allergy in acute infectious diseases. Now that the Mantoux test has almost superseded the method of Pirquet in clinical work, it is clearly important to know of any condition which may influence its results. The possible suppression of the tuberculin response was investigated in 2000 cases of acute infections, including measles, scarlet fever, chicken-pox, diphtheria, and pertussis. Measles and scarlet fever appeared to cause a temporary depression of tuberculin sensitivity lasting for about a week from the appearance of the rash, and this was thought to be due to the patient's sensitivity having fallen below the reaction threshold as a direct result of the action of the rash on the skin itself. The importance of repeated tests before a negative result to a given dilution could be accepted was clearly demonstrated.—Since loss of weight is one of the commonest precursors of a relapse in juvenile rheumatism, E. C. Warner and F. G. Winterton (London) have made a dietetic study of this disease. They found no signs of undernutrition in rheumatic families as a whole and the rheumatic children were up to the normal standard of physical development for English school-children, though the parents thought their appetites not so good as those of the non-rheumatic. Confirmation was obtained for the mother's statement that the rheumatic child was less fond of meat and fresh fish than the normal child; it also seemed that an increase in animal fat in the form of butter and milk was of prophylactic value. There appeared to be no lack of vitamin-C intake by children in rheumatic families, and the provision of extra vitamin A and D had little or no preventive action.—W. R. Snodgrass (Glasgow) report on the therapeutic use of iodides in the treatment of syphilis. On a basis of 1750 cases he was able to show that iodides had no effect upon the spirochætal content of the lesions of primary and secondary syphilis, but that they caused the resolution of tertiary skin lesions. The optimum dose appeared to be grs. 15 thrice daily, but resolution was accelerated by a single big dose orally or a dose intravenously. Iodides had no influence on the Wassermann réaction in any stage of the infection; iodism could be stopped by an intravenous dose of sodium iodide.—G. R. P. Aldred-Brown and J. M. H. Munro (Bath) have inquired into the connexion between the amount of albumin, globulin, and fibrinogen in the blood-plasma and their ratio to the total proteins, in chronic rheumatic disorders. They report wide variations in the value of the protein. the total protein and the non-protein nitrogen between healthy adults, patients with chronic rheumatic disorders and non-rheumatic persons whose ages and economic stresses were more or less comparable.—E. M. Watson and Marion A. Wharton (London, Ontario) have scrutinised the various dietary measures which have been advocated for diabetes. They hold that no universal rule applies; the type of diet best for a particular patient has to be governed by individual requirements. A high-fat, low-carbohydrate diet lowered or eliminated the insulin requirements of many patients, but it tended to reduce carbohydrate tolerance and favour ketonuria. Conversely, a rise in carbohydrate, provided the fat was kept low, did not necessarily require increased insulin dosage, since it improved tolerance.—Leslie Cole (Cambridge) writes on the treatment of tetanus, with observations by E. T. C. Spooner. This paper was reviewed in a leading article last week.—R. D. Passey and J. McD. Holmes (Leeds) approach the problem of the possible increase in intrathoracic neoplasia from a new angle. They do not think such an increase has been appreciable; nor do they find reason to incriminate the ætiological factors suggested by those who believe the incidence to be rising.

THE LANCET

LONDON: SATURDAY, AUGUST 10, 1935

THE DOCTOR AS ADMINISTRATOR

In the administration of medical services of any kind many affairs of a non-medical character have to be handled. Purchases have to be made, incomes assessed, moneys collected, clerical staffs controlled, and clerical work organised. Lay staffs of various categories are engaged, put to work and supervised. Often, as in the department of a medical officer of health, the lay staff far outnumbers the medical, and in his daily routine the head of the department is concerned with little that is ordinarily regarded as lying within the province of medicine. Is he the sort of officer whose training makes him best suited for the purpose? Or would a lay official at the head of the department be more efficient? Or should a medical officer remain in charge of purely medical affairs, while those of a non-medical character are dealt with by a completely independent officer specially trained in administration? The Hadow Committee, which reported in 1934, addressed itself to problems of this kind in relation to all branches of local government. While suggesting that "local authorities should not always take it for granted that the principal officers must necessarily be technically qualified," it was unable to recommend that any radical change of the existing system was desirable or practicable.[1] There is a tendency on the part of impatient critics to lay too much stress on small flaws in the machinery of administration and to suggest changes which overlook the objects it is intended to achieve. If administration means more than mere business management, handling correspondence, record keeping, filing, supervision of lay staffs, and a close scrutiny of expenditure, if it means the application of scientific knowledge to the betterment of the lives of the people, the guidance of technically qualified assistants, the conveyance of a department's collective experience to those who determine policy, and the application of such policy to the day-to-day work of the department, a professionally qualified head is surely best fitted for the purpose. The Hadow Committee commended the arrangement, already operating in some areas, whereby a senior (but subordinate) official is appointed as a lay administrative officer. This type of appointment appears to have worked well in Manchester and other towns where it has been tried. The chief clerk of any health department is virtually in this position, and it is desirable that the qualifications and training for such posts should be defined and the scales of remuneration sufficient to attract capable officers.

Since the transfer of poor-law functions in 1930, the relation of medical and lay officers in hospitals has been added to the problems of local authorities. The executive officer of a mixed institution is the master, a layman, to whom the medical officer is administratively responsible. Difficulties have frequently arisen in the past and some authorities have overcome them, with the sanction of the Minister of Health, by appointing the medical officer also to be master of an institution which contains a large proportion of sick inmates. There are legal obstacles to this subterfuge but they are not insurmountable, since the Minister may sanction "departures from the regulations." [2] In poor-law hospitals, as distinct from institutions, the medical superintendent quite definitely "governs and controls the hospital and the officers, assistant officers, servants and inmates." [3] Although the steward has specific responsibilities, there is no question as to who is the chief official, since the steward's reports must be submitted through the medical superintendent.[4] This is not a new state of affairs dependent upon the passage of the Local Government Act, 1929, but the tendency to appropriate parts of institutions for medical uses, or to introduce medical control by unification of the appointment of master and medical officer in one person, may account for the discontent among lay officers which has recently been expressed. Thus, according to reports in the lay press, at a meeting of the National Association of Administrators of Local Government Establishments (a rather comprehensive designation) it was contended that a lay administrator should be solely responsible for the departments of supply, maintenance, accounting and recording other than purely medical statistics. It was suggested that many medical superintendents regard stewards of hospitals as nothing more than "glorified office bosses." The idea underlying these and similar protests seems to be that medical men should have no responsibility for non-medical administration in hospitals and that a lay officer should be answerable in such matters directly to the governing body. We sympathise heartily with the desire to relieve medical officers of details of lay administration and commend the Hadow Committee's suggestion to the members of this Association, believing that it is in accord with the arrangement which already obtains in most local authority hospitals and with the requirements of the Public Assistance Order. The Association appears to be anxious to collaborate with the Society of Medical Officers of Health [5] who may be able to assist them in the removal of any real grievances.

Good administration, however, requires that there should be one administrative head of a hospital, who, in the last issue, shall take decisions and justify them to the governing body. The functions of a hospital are the treatment of the sick, the advancement of medical knowledge, the training of nurses, and often the teaching of medical students. All problems of administration are ancillary to these objects. What is done and what is bought are more important questions than executive methods. The well-being of the patients and the conditions under which the staff work and learn depend upon the comprehension of the hospital's objects by its administrative head. Clearly these will be attained best under medical administration, provided that medical men—or women—are selected for appointment because of their fitness for this kind of work, and relieved from details not only of lay administration but also of a clinical character. We believe, therefore, that the practice which prevails in local authority hospitals should continue. If it is true, as Dr. R. Worth stated at a recent meeting of the Royal Medico-Psychological Association, that there is a move on foot to oust the medical superintendent from control of mental hospitals, we hope that it will fail. Further, in that pooling of knowledge and experience which the Act of 1929 was intended to foster, the voluntary hospitals might learn something in this respect from the council hospitals. Outside of Scotland, and with the exception of a very few hospitals in England and Wales, voluntary hospitals have favoured lay administrators. An unprejudiced examination of the relative merits of the two systems by governing bodies of hospitals might lead them to a different point of view. If the voluntary hospitals are to survive, their defects of administration which the developing council hospitals are throwing into relief must be corrected, and medical administrators would be quick to put their fingers on them and force them upon the notice of the managers.

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[1] Report of Departmental Committee on Qualifications, &c., of Local Government Officers, p. 34.

[2] Public Assistance Order, 1930, Article 8.

[3] Ibid., Article 175.

[4] Ibid., Article 177.

[5] Public Health, December, 1934, p. 106.

LATENT TUBERCULOUS PERITONITIS

Notable advances have recently been made in the diagnosis of early tuberculous disease and radiology has enabled us to overcome difficulties that but a few years ago appeared to be insuperable. The diagnosis of incipient tuberculosis in joints or bones has been simplified by radiology, and the same means of investigation enables us to diagnose early pulmonary lesions with a confidence and accuracy which a few years ago was impossible. But no such confidence attends our efforts to diagnose abdominal tuberculosis, whether the result of a primary or of a secondary infection. Autopsy may reveal an extensive ulceration of the intestines in a consumptive, although such a condition was entirely unsuspected during life. Laparotomy for an acute appendicitis may reveal a peritoneum studded with tubercles in a patient who was apparently in good health up to the day when acute symptoms developed. The student is taught that tuberculous peritonitis may be acute, subacute, or chronic, that there is an ascitic and a plastic form of the disease, that operation will mysteriously cure the one and less mysteriously fail to benefit the other. A wasted frame and a protuberant belly which provides interesting signs of shifting dullness, or a thrill that may be flicked from one flank to the other under the steadying hand of a colleague, supply evidence of ascitic disease. Cachexia, fever, abdominal discomfort, and bowel irregularities, associated with a "doughy" sensation when the abdomen is palpated, suggest the plastic form. In either instance the disease is one which impresses the mind, and to the fifth-year student the diagnosis of abdominal tuberculosis appears to be a fairly straightforward matter.

In general practice the problem is found to be by no means so simple. An ill-nourished and anæmic-looking child complains of abdominal discomfort, the clinical thermometer registers a low fever, an anxious mother suggests "consumptive bowels," and if her diagnosis is not accepted demands to be informed "what really is the matter with the child." Physical signs are unhelpful and home treatment seems unavailing. The easiest method of dealing with the case is the notification which provides a short cut to a children's sanatorium. If the patient is admitted to a sanatorium, despite prolonged observation and searching investigations, evidence of tuberculosis is seldom forthcoming in cases of this type. Indeed, more often than not a regimen of correct feeding, regular hours and adequate rest results in a rapid amelioration of symptoms, which do not recur until the child returns to the slum tenement or farm labourer's cottage from which he came. Though admissions of patients reputed to be suffering from abdominal tuberculosis are frequent, very few patients retain a diagnosis of tabes mesenterica or tuberculous peritonitis when they leave the sanatorium. As the abdomen contains the digestive system it is not surprising that symptoms arising from digestive disturbance are referred to it and that abdominal discomfort is usually correlated with wasting or malnutrition. The child who suffers from chronic intestinal catarrh may complain of pains, suffer with constipation and fail to gain weight. Flatulent bowels and under-nourishment often suggest, they seldom imply, tuberculous disease. But though a diagnosis of tuberculous peritonitis is often made on insufficient grounds, it is possible that the disease is sometimes overlooked, or its symptoms disregarded until exacerbation of disease or a superadded infection results in its discovery. Laparotomy performed in the early hours of an acute illness may reveal tuberculous lesions so widespread that, unless tubercles grow like mushrooms overnight, we are driven to the conclusion that lesions—the term disease is in some cases inapplicable—have been present for a period of weeks or even months at the time of their discovery.

It has for long been recognised that inflammation of the appendix may be due to an infection by Koch's bacillus and the tuberculous origin of a chronic appendicitis or perityphlitis may sometimes be suspected from the patient's appearance, from the clinical picture, and the physical signs in the abdomen. Laparotomy may confirm the diagnosis and reveal the tuberculous origin of the disease at a glance. A Rumanian surgeon, Dr. At. Janes has recently drawn attention[1] to a curious phenomenon sometimes encountered in patients who have received treatment for "surgical" tuberculosis and who develop symptoms of acute appendicitis. Operation in such cases may reveal an appendix inflamed or containing pus and exhibiting no evidence of tuberculous disease. Nevertheless, ascitic fluid found in the vicinity and inoculated into guinea-pigs may cause tuberculosis. From these observations, Dr. JAMES concludes that there is a latent form of tuberculous peritonitis, and that the condition may not give rise to any symptoms of disease. It is noteworthy that the condition was observed in young patients who had suffered from bone or joint tuberculosis, for it is in patients of this type that latent pulmonary tuberculosis is sometimes discovered on X ray examination of the chest. Thus we cannot assume that latent abdominal tuberculosis is a common condition, or that it is apt to occur in children who are not suffering from any recognisable form of tuberculosis in other organs.

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[1] La péritonite tuberculeuse latente, Revue de la tub., February, 1935, p. 193.

NERVOUS DISABLEMENT IN WAR AND INDUSTRY

WE may attribute to the late war the enforced recognition of the importance of the minor psychoses and some of the subsequent growth of interest in their study and treatment. The recent conference of the Ex-Services Welfare Society, which deals solely with ex-Service officers and men suffering from neurological and mental trouble, gives evidence that the original stimulus is still, unfortunately, continuing; for the official subject of discussion was the persisting effect of war neuroses. The conference was concerned not only with men recognised originally as suffering from war stress, but with the late development of disability in those who had not applied for pension until they were finally beaten after years of struggle. It is in such cases that the Society is able to give help that the Ministry of Pensions cannot give. But the Society can do more than that. During and after the war the Ministry not only established clinics but trained already qualified men for service in them; they provided hospitals for those that needed them and freely gave grants and facilities for training to nervously disabled pensioners. The one thing beyond their power was to give continued support to the men in the social and economic struggle, and here the Welfare Society finds its special task. At the conference repeated reference was made to economic difficulties and civil stress, and the hostels and sheltered industries maintained by the Society have been called into being because the essential need of these men is opportunity to work without the combination of uncertainties and rigid demands found in ordinary industrial life. This need is definite, whatever may be thought of the causation or attributability of the men's troubles; without help such as the Society provides, the outlook for many sufferers would be hopeless.

An article by Dr. AUBREY LEWIS in our present issue, on neurosis and unemployment, is concerned with an almost identical problem which, as he shows, calls for similar handling. Whether unemployment produces psychoneurotic trouble is an obvious question; but Dr. LEWIS does not attempt to answer it. His investigations consisted of a detailed examination of the clinical findings, and the occupational and family history, of 52 men referred to a clinic by local public assistance committees because of presumptive mental disorder. All were on out-relief and in the histories there was often abundant evidence of the previous existence of neurosis and, indeed, of a tendency to seek the refuge of pension or compensation. At the same time, out of 38 men to whom this observation applied, 26 gave satisfactory work records or, in other words, had shown themselves at one time to be efficient members of the social organisation. This should be linked with the findings of Industrial Health Research Board investigators that severe psychoneurotic symptoms may exist without producing industrial disability; that is, we may suppose, so long as working conditions are satisfactory to the individual.

Dr. LEWIS concludes that these cases are as much social as medical problems and advocates psychotherapy together with measures which, as he points out, are identical with those already carried out by the Ministry of Pensions and the Welfare Society. He remarks that, as far as psychopathology is concerned, there is nothing to distinguish these men from patients in other walks of life who show *similar* symptoms, but in their reactions there appears a general attitude of touchiness and resentment that brings them into line with the chronic "compensation or pension-neurosis." We agree that prophylaxis of these disorders must wait on better knowledge, but the development of this unfortunate state of mind clearly deserves more attention than it has hitherto received. Condemnation there has been in plenty; for few writers adopt towards it the objectivity successfully maintained by Dr. LEWIS. Whoever has studied the victims of compensation-neurosis, whether following accidents or in the occupational neuroses, finds among them men, previously decent citizens, who seem to have as their only object the clinging to compensation. In some of them the elements producing that mental attitude can be elucidated. Genuinely incapacitated by nervous symptoms, the man receives little or no skilled help; the symptoms develop unhindered even if he fights against them, and the prospect of again being fit to take up his work begins to recede. It is no one's business to find him work within his power, which is a necessity for his recovery (this situation has long been recognised in miners' nystagmus, the man finding no alternative between going back to work down the pit or drawing compensation). Without understanding of his own condition—the first requisite for successful psychotherapy—he must accept the alternative of compensation and bend all his energies towards retaining it. If to this hypothetical story we add that the nervous sufferer does not thus reason out his behaviour, but reacts intuitively and emotionally to the situation, we can understand the evolution of the compensation-neurosis in a previously self-respecting and hard-working man. Whatever views we may hold about the fundamental causes of the minor psychoses, the miserable victim of the compensation-neurosis is a social product; among the other admirable work of the Ex-Service Welfare Society and the psychiatric clinics now being established we see these cases at last receiving that attention and understanding that has for so long been lacking.

AN INDEX OF BLOOD REGENERATION

An important stage in the development of each science is the period when man is just able to give exact quantitative expression to the phenomena he is studying. In the past ten years MINOT and his fellow-workers have not only given us a cure for pernicious anæmia and so stimulated an enormous amount of fundamental work on the ætiology and treatment of blood diseases, but they have also given us a method of accurately estimating the degree of hæmopoietic activity and response to therapy—a method which has lent significance to so much recent work on the anæmias. With our issue to-day we publish a supplement by MINOT and CASTLE in which they discuss the exact principles underlying the methods they have perfected for assessing erythropoietic activity by means of the reticulocyte response.

In order to understand these methods it is necessary to recall the relation of the reticulocyte to the mature red cells. In the blood stream of the healthy adult the majority of the red cells are mature. The young nucleated cells (normoblasts) of the marrow are not found, but a small percentage of cells may show a bluish network or reticulum when stained with brilliant cresyl-blue. These cells, because of their appearance, are known as reticulocytes and are young cells intermediate between the normoblast and the mature red cell. Under suitable experimental conditions their development into mature red cells, through stages in which the amount of reticulum gradually decreases, can be demonstrated in vitro. The reticulum is derived from the basophil substance present in the cytoplasm of young nucleated red cells and is not a nuclear remnant. In ordinary films such cells appear as polychromasic red cells, or cells showing punctate basophilia. Increased erythropoietic activity in the bone-marrow from any cause is made apparent in the peripheral blood by an increase in the number of reticulocytes. If activity is great even younger cells of both red and white cell series will appear. The character of the peripheral blood is indeed an extraordinarily accurate mirror of the character of the bone-marrow. When reticulocytes only are found in excess it is usually safe to assume that erythropoiesis is proceeding in a normal way, though at an increased rate; if normoblasts are found there is clearly a greater increase in rate of development, though presumably erythroblastosis is still of a normal type. If even more primitive cells, as primary erythroblasts, predominate, a grossly abnorm type of red cell delivery is in progress. Wh leucopoiesis is primarily disturbed, as in t leukæmias, the immature white cells afford index of marrow activity. As far as erythropoie is concerned it has been shown by MINOT and othe that a careful quantitative estimation of the p centage of reticulocytes appearing in the peripher blood gives an accurate measure of erythropoie activity. In anæmia with an aplastic marro few, if any, reticulocytes are found. In anæm with an active marrow, as in acholuric jaundic there is a high output of these cells. In t dyshæmatopoietic anæmias, for instance, pe nicious anæmia or leucoerythroblastic anæmi when marrow activity is arrested, the numb of reticulocytes is variable. It is, howeve as an index of the effectiveness of any for of treatment that the reticulocyte count ha proved of greatest value, for if no interferin factors are present and sufficient quantities appropriate potent material are given, the outpu of reticulocytes in any patient is strictly relate to the initial number of red cells and hæmoglobi and can therefore be used as an extremely accura measure of the efficacy of any therapeutic procedur

The fact that the principles underlying th interpretation of reticulocyte reactions must b carefully understood, and certain precautions observed if full use is to be made of the informatio they provide, is emphasised by MINOT and CASTL The reactions should be of special value in estimating the potency of different commercial preparations. An important practical point emerge here, namely, that the description of any commercial product should indicate what dail amount is just sufficient to produce a maxima reticulocyte response, which is the only accurat measure of potency. At present, the doctor prescribing one of these preparations is told only th original amount of liver or stomach from whic it has been obtained, or the weight in grammes o some constituent—for example, of iron. It i difficult for him to assess the potency of the en product, and it is that alone with which he i concerned. Now that MINOT and CASTLE have added to their previous important discoveries a delicate means of measuring the potency of each member of a whole group of therapeutic remedies, let us hope that it will be speedily put to practical use.

AUSTRALIAN AND NEW ZEALAND ASSOCIATION OF RADIOLOGY.—On May 17th the first annual general meeting of this association was held at Canberra, when Dr. A. T. Nisbet was elected president; Dr. H. M. Hewlett, vice-president; Dr. H. R. Sear, hon. treasurer; Dr. H. M. Cutler, hon. secretary; and Dr. J. G. Edwards, Dr. P. Parkinson, Dr. J. C. Clendinnen, Dr. J. O'Sullivan, Dr. J. S. Verco, Dr. W. Holman, Dr. V. McDowall, Dr. B. L. W. Clarke, Dr. Syme Johnson, and Dr. C. C. Anderson, members of council. The association has been established to promote the advancement and study of radiology and allied sciences and encourage research and experimental work in connexion with those sciences. It is hoped to provide facilities for general conferences and discussions, and supplements to the *Medical Journal of Australia* and the *New Zealand Medical Journal* will be devoted to the work of members.

ANNOTATIONS

NERVE LESIONS AND VITAMIN-A DEFICIENCY

Of late years attention has been directed repeatedly to the possibility that vitamin deficiency is responsible for some forms of degeneration within the central nervous system. In this country E. Mellanby has indicated a probable relationship between vitamin-A deficiency and the so-called toxic degenerations such as ergotism, pellagra, and lathyrism. Extension of this conception to account for the lesions of subacute combined degeneration and disseminated sclerosis has on the whole found less support, although the evidence for such a relationship is suggestive enough to encourage further inquiry along this line. The recent publication [1] of further experimental work by Prof. Mellanby emphasises the importance of the part played by vitamin A in maintaining the integrity of the nervous system especially in young animals. Rabbits of 8–10 weeks old were used in his experiments, and he has found that widespread degeneration of the myelin sheaths in both peripheral and central parts of the nervous system follows the maintenance of these animals on a diet deficient in carotene and vitamin A. Clinically there is stiffness of the limbs, especially of the hind legs, after 2–3 months of this diet and later still xerophthalmia and head movements are observed. Histologically the afferent paths of the nervous system are most affected—namely, the spino-cerebellar and spinoreticulothalamic tracts, the posterior columns of the spinal cord and the afferent fibres in both cranial and spinal nerve-roots, excluding, however, such fibres in the vagus nerve. Slight degenerations may develop in the efferent pathways at the same time, but these seem to be exceptional. Mellanby also describes degenerative changes in the neurones on the sensory side but finds it impossible to say whether neurone or fibre is primarily affected.

Although the histological descriptions are based entirely on Marchi preparations (as far as myelin sheath degenerations are concerned), there can be little doubt of the validity of these results in view of the careful controls carried out to eliminate possible confusion with post-mortem artefacts. The importance of the work, which Mellanby describes as being of a preliminary nature, cannot now be assessed. As he says, "the fact that degenerative changes are more easily produced in young animals than in old suggests that these nutritional factors play a large part in determining the structural development of the nervous system, either as a whole or in part, in early life and even in the fœtus. If this is so, it is another instance of the supreme importance of the proper nutrition of the mother during pregnancy and lactation, and of the young child during the development of the nervous system."

PROPHYLAXIS WITH A LIVING PLAGUE VACCINE

At a meeting of the French Academy of Medicine [2] last month Dr. G. Girard, director of the Pasteur Institute of Antananarivo, Madagascar, described further results obtained by the prophylactic use of an attenuated, but living, vaccine of *Bacillus pestis*. Girard and J. Robic had previously brought forward evidence that the living "E.V." strain of *B. pestis* is superior to killed vaccines for preventing plague both in animals and in man. For human beings it had then been used with extreme prudence and without the slightest accident immediate or remote. The further series of inoculations now reported on with this living "E.V." strain of plague were carried out in Madagascar between October, 1934, and May, 1935. A census of the particular district concerned had been made two months previously, and the population (excluding children under two years, who were not vaccinated) was found to be 96,000, of whom 46,879 voluntarily submitted themselves to inoculation. Vaccination centres were established throughout the district, and the vaccine was transported in thermos flasks charged with ice. The reactions to the vaccine were of minor degree and did not prevent the inoculated from continuing their occupations. Afterwards, special care was taken to ascertain the cause of death in the district by bacteriological investigation, and the figures for five months (December to May) are summarised as follows. Among the vaccinated (46,879) the number of deaths from plague was 22, or 0·47 per thousand, and the general mortality 225, or 4·8 per thousand. Among the controls held (these are put at 60,000, which is nearer the true mark than the official census figure of 49,121) there were 100 deaths from plague, or 1·66 per thousand, and the general mortality was 581, or 9·7 per thousand. Girard points out that not only the plague mortality, but also the general mortality was reduced by half among the vaccinated. Septicæmia from *B. pestis* was far less among the vaccinated, and it is emphasised that this is of special importance in a country where *Xenopus cheopis* is widely distributed and capable of transferring the infection. Girard admits that his statistics are in places open to criticism, but maintains that the immunity conferred by the living vaccine, both in animals and man, is evidently superior to that produced by the killed vaccine.

CAN ASCARIS INFECTION BE AIR-BORNE?

In an annotation last year on the prevention of ascaris infection [1] we remarked that, keeping this end in view, controlled experiments were needed on the bore-hole latrine. Since then the suggestion has been put forward [2] that the attraction of this structure for the Indian is likely to be great, seeing that it can be made and used privately close to his own house, and being his own is all the more likely to be kept clean. That is true. But if properly used will it do more good than harm? The bore-hole latrine is a narrow tube, 18 in. across, normally made straight down into the subsoil water, and often with a lining of basket work to prevent its walls from falling in. It has been said that when the tube has reached the subsoil water and is not overworked, fæces will become completely liquid and be lost. But in just such conditions it is well known that this is far from being the end of fæcal bacteria; there may be wide carriage of them by subsoil water, and the suggestion so made becomes in fact one for the deliberate fouling of the usual drink of hundreds of millions of those living in the tropics. Moreover it is wrong to take it as probable that fæces ejected from the anus at the top of a long narrow vertical tube will drop cleanly by gravity into the water at the other end. The fæces of most Indians are normally mushy, and after the passage of a soft stool the bore-hole will be spattered to within a few inches of its top. Moreover the rough holes of the bore or of its lining cannot be cleaned; where fæces have landed, there they must rest. Assuming that there are ascaris eggs within them, the question whether embryos which have formed will or will not become parasites in man depends on factors analysed by Anne McRae[3] and H. W. Brown.[4] There is no hatching of the embryo in the sense in which a chick makes its own way out of the shell, for the burst in the ascaris eggshell is made by physical forces acting from without; thus, while chemicals have little effect, the stirring of ripe eggs in wet sand has set free 80 per cent. of the embryos, and after a long car journey the same thing has happened on a great scale in sand culture. Again, when ascaris eggs are dried, an air bubble is formed within the shell, and when they are next wetted osmosis becomes the cause of a break in all the shells and all the embryos become free. The very rough outer coat of the ascaris egg gives the resistance necessary for air-carriage; with air inside it the dry egg will be lightened; and the arrival of the egg on the moist mucosa of the nose should then bring about "hatching." Doubt as to whether air-carriage does or does not take place could, we suggest, be resolved under experimental conditions by use of the hot air thermal precipitator of Whytlaw-Gray and Lomax, referred to by H. L. Green and H. H. Watson.[5] This filters out from air particles varying from 200 µ across to ultra-microscopic size, and it should demonstrate the presence or absence of ascaris eggs. The question of air-carriage in another worm infection is important for the British Army in India, for Colonel W. P. MacArthur has given strong reasons for the belief that *Cysticercus cellulosæ* is conveyed in this way. The effects of this parasite, however, are too grave for its mode of spread to be tested on man or even (with a quiet mind) by man. Accordingly the possibility that ascaris may be air-borne requests investigation not only for its own importance but also for the knowledge it may give of that by *C. cellulosæ* and perhaps by other worm parasites. Here there is no great danger; and here there is a test animal to hand, the pig, on the mucosa of whose nose dried embryonated eggs can be placed.

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[1] Brain, 1935, lviii., 141.

[2] Bull. de l'Acad. de Méd., 1935, cxiv., 16.

[1] The Lancet, 1934, ii., 1061.

[2] Indian Med. Gaz., June, 1935, p. 333.

POOLED HUMAN MILK

THE use of pooled surplus breast milk for feeding premature infants in institutions, or for young babies with severe alimentary disturbances, is being increasingly advocated in this country; but Prof. W. Catel,[6] director of the university children's clinic in Leipzig, throws doubt on the value of human milk for such purposes after it has undergone the heating which is customary. In view of the difficulty of organising and maintaining a steady supply, and the correspondingly high price which has to be paid, his observations demand full consideration. Having compared the morbidity and mortality among premature infants fed on fresh human milk with the corresponding rates among those fed on similar milk heated for three minutes at 100° in a Soxhlet apparatus, he finds that the latter are definitely at a disadvantage; he particularly comments upon the greater frequency of bowel disturbances among those receiving the heated milk. In another series he finds that the daily gain in weight was 25 per cent. less among infants fed on sterilised human milk than among those fed on fresh breast milk; some of the children indeed did better on a cow's milk mixture of similar caloric value than on either form of breast milk. Catel therefore believes that sterilised human milk has no advantages over a cow's milk mixture for the rearing of "delicate" babies. This is an astonishing conclusion, and the number of cases described in detail in his paper is so small that it is impossible to judge whether it is really justifiable. Logically from his observations Catel argues that from the social standpoint schemes for the collection and distribution of breast milk are not worth while. The surplus milk of healthy mothers, used in a fresh state, he still regards as the optimum diet for premature or delicate infants deprived of their own mother's milk, and he argues for a raising of the status of the wet-nurses commonly employed in German institutions.

SILENT MASTOIDITIS

ACUTE suppurative otitis media may follow any of several courses. After discharging through a natural or artificial opening of the drum membrane, it may, and as a rule fortunately does, subside with healing of the perforation within a period which varies from a few days to several weeks. Alternatively frank and easily recognisable signs of mastoiditis, and sometimes also of intracranial complications, may develop; or the discharge may persist and become chronic without the appearance of obvious mastoiditis. During the first few days tenderness over the mastoid is common, and most otologists agree that the mastoid antrum and cells are usually involved in the inflammation, but tend to recover in the absence of such adverse factors as extreme virulence of infection, lowered resistance, or obstruction of drainage. Definite mastoid disease and intracranial complications are rare in the first week, and many authorities are convinced that the subsequent course of the disease is unsatisfactory when the mastoid has been opened at this early stage. On the other hand, when the discharge from the ear persists undiminished, even in the absence of other symptoms, for more than about three weeks, it is highly probable that there is suppuration in the mastoid. *If nothing* is done the best that can be expected is a permanent perforation [illegible] with its attendant dangers and [illegible] mastoid operation should be undertaken in such cases, and a surprisingly extensive infection will usually be found.

Dr. George D. Wolf,[1] of New York, who deals with these matters under the title of "silent mastoiditis," quotes Koerner's statement that he has always found bone destruction when there is a profuse ear discharge lasting 4–6 weeks, except perhaps when the discharge is diminishing. He does not define the term "silent mastoiditis" with exactness, but cases are certainly common in which the course of the disease may be described as asymptomatic, atypical, or insidious. There is, however, nearly always a discharge from the ear and usually other signs can be found if carefully sought, such as slight occasional rises of temperature, narrowing of the deep meatus, bulging of its postero-superior wall, or tenderness on deep pressure at some spot behind the ear which, at least after the third week, is a definite indication for operation. It occasionally, though very rarely, happens that a mastoid abscess forms when the membrana tympani is intact, having ruptured and quickly healed or never having perforated; such cases naturally cause great difficulty of diagnosis, but there is always a history of earache a few weeks before, the drum is not entirely normal in appearance, and the hearing is somewhat impaired. Apart from such rarities, acute mastoiditis will seldom pass undetected if it be remembered that its development is by no means always accompanied by such obvious signs as severe pain and high fever. The "cortical" mastoid operation is not in itself a dangerous one—Mr. T. B. Layton lately said that from the patient's point of view it is a far smaller operation than the removal of tonsils and adenoids[2]—and nearly always it leaves behind a healed, intact membrane, usually with little or no impairment of hearing. If it were performed in all cases of acute suppurative otitis which show no signs of recovery by the end of the fourth week, a very large proportion of the great mass of chronic aural suppuration would be prevented, a fruitful source of deafness abolished, and the intracranial complications of chronic otorrhœa largely eliminated.

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[3] Jour. Parasitol., 1935, xxi., 222.

[4] Ibid., 1928, xv., 14.

[5] Physical Methods for the Estimation of the Dust Hazard in Industry. Med. Research Council, Spec. Rep. Ser. No. 199, 1935.

[6] Deut. med. Woch., 1935, lxi., 985.

[1] Jour. Amer. Med. Assoc., 1935, civ., 2315.

AMBULATORY TREATMENT OF FRACTURES OF THE FEMUR

In cases of fractured femur it is by no means easy to provide support and fixation sufficiently rigid to allow of weight-bearing from the outset. With all his enthusiasm for the unpadded plaster cast and ambulatory treatment in fractures *below* the knee, Böhler[3] nevertheless states that the method of continuous traction is preferred in his clinic for fractures of the femoral shaft. The trouble about fixation with plaster, in these particular fractures, is that the plaster cast does not grip the limb firmly enough to resist the great tendency to deformity at the fracture site—a tendency due mainly to the powerful pull of the thigh muscles, and also (in walking) to the tendency of the upper fragment to "settle down" in the splint. R. A. Griswold,[4] of Louisville, Kentucky, has been so much impressed, however, by the advantages of ambulatory treatment that he has evolved a method—analogous in most particulars to that used in many clinics for fractures of the tibia—by which he believes that ambulatory treatment has been rendered feasible with the assurance of good anatomical and functional results. For such treatment Griswold claims not only the obvious advantage that it shortens the time the patient occupies a bed in hospital, but also that the use of the limb in weight-bearing and walking encourages healing, and helps to maintain muscular strength and normal joint function. Measurement of the circumference of the thigh and calf shows little or no wasting, and, on removal of the cast, as much as 45 degrees of painless movement of the knee-joint may be possible at once.

The principles of Griswold's method may be summarised as follows: The length of the limb is restored by extension; and after the shortening has been corrected, two pins are inserted, one transversely through the distal fragment just above the adductor tubercle, the other in an antero-posterior direction at, or slightly below, the level of the lesser trochanter. By manipulation of these pins, angulation and rotation of the fragments on one another is corrected. The limb, with the correct alignment of the bone-ends restored, and with the pins in situ, is encased in an unpadded plaster cast, which reaches from the xiphoid cartilage to the toes. Walking is permitted as soon as the plaster has hardened. So that the plaster splint may act in the same way as a Thomas's walking calliper—i.e., by counter-pressure on the ischial tuberosity—a roll of padding about 8 inches long, and of the thickness and firmness of a Thomas's splint roll, is placed in situ and incorporated in the plaster. On the perineal side of the thigh the plaster is so modelled as to hold the pad in position and to form a shelf against which the body-weight can be partly supported.

To certain points Griswold draws particular attention. The pins, for example, are not used at all for extension, the correct length being restored before their insertion; and they are thus free for manipulation. By experience, the importance of the proximal pin has been demonstrated. At first a pin was used to correct the posterior angulation of the *distal* fragment of fractures of the lower third of the femur, trusting to the ischial pad to prevent "settling down" of the upper fragment in the plaster case. This plan, however, proved unreliable, and use of the upper pin was adopted. For manipulation and support of the pins, special mechanical arms are attached to the table on which the patient lies for reduction and fixation of the fracture. The properly constructed plaster cast for an adult should weigh about 12–14 pounds. Five patients treated by this method walked on the second to the eighth days following injury; in another 5 cases the same fixation was applied, but on account of other fractures (2 cases), psychosis (2 cases) and transfer to another hospital (1 case), ambulatory treatment was not adopted. The results have been very satisfactory; and for straightforward fractures, without complication, the stay in hospital has been reduced to an average of twelve days.

SENSITISATION TO LIGHT

It is not surprising that so vital an influence as light should find its way into many chapters in the book of medicine. In the fourteenth century John of Gaddesden used red light to diminish the ravages of small-pox in the skin, and there are still practitioners who believe in the efficacy of coloured beams. Comparatively recently Finsen extended light therapy into the invisible regions of the spectrum, and to-day ultra-violet and other forms of irradiation are very widely used. Much remains obscure, however, in the mechanisms by which these remedies do their work. A fact which has a bearing on their action is that the presence of certain dyes and fluorescent substances in the blood stream is capable of sensitising the subject to light—a discovery which was once tentatively applied in connexion with the Finsen treatment of light. The observation that hæmatoporphyrinæmia is associated with hydroa vacciniforme has pointed the way to an explanation of the wide range of diseases (both in man and in animals) which are due to light irritation or which show light-sensitiveness as a characteristic symptom; summer prurigo and actinic dermatitis, lupus erythematosus, and pellagra are examples. In reviewing this interesting subject Dr. Eidinow[1] describes some original work which he has done using eosin, erythrosin, fluorescin, and rose-bengal as light sensitisers. He finds that after these preparations have been injected into the blood stream or the tissues infra-red or luminous rays produce effects comparable with those of ultra-violet irradiation. Thus hæmolysis of red cells suspended in saline, a lethal effect upon infusoria and a raising of the bactericidal power of the blood follow exposure to luminous rays when sensitisers are present. These are, however, not effective when painted on the skin and they are excreted within a few hours of being injected. This work suggests a possible field of therapeutic research, and Eidinow claims to have had some success in the treatment of lupus and chronic ulcers among other conditions, by the local injection of sensitisers and subsequent exposure to infra-red and luminous radiations.

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[2] THE LANCET 1935, i., 1445.

[3] Böhler, L.: The Treatment of Fractures, Bristol, 1935.

[4] Surg., Gyn., and Obst., April, 1935, p. 848.

[1] Eidinow, A.: Brit. Jour. Derm. and Syph., 1935, xlvii., 277.

IN MEMORY OF HUGHLINGS JACKSON

AMONG the tributes to Hughlings Jackson in this centenary year, those of foreigners have a special place. Elsewhere in this issue will be found an account of the commemorative address in which Prof. Otfrid Foerster spoke of the prescient genius of the greatest of English neurologists. At the International Neurological Congress, Prof. Otto Sittig, of Czechoslovakia, who has done much, by translation and exposition, to make Hughlings Jackson's writings accessible abroad, pointed out how he had anticipated modern views about consciousness. From Hungary comes an impressive memorial volume[1] in which the published writings from the *Stephen Tisza University in Debreçen* are collected and dedicated to Hughlings Jackson, with an appreciatory biographical foreword by Prof. Benedek, the director of the clinic in mental and nervous diseases there and editor of the volume. The papers cover a wide range of topics in neurology and psychiatry, some of them in fields unexplored until recent years. One of the most interesting contributions is a monograph by Prof. Benedek concerning the effects of insulin shock therapy on perception. Insulin had been used in his clinic for several years as a means of combating the disinclination for food in negativistic schizophrenic patients; later it was employed to produce hypoglycæmic shock in schizophrenia, and to a less extent in confusional syndromes. In the patients so treated special disturbances occurred in the perception of forms, space, and movement. The experimental production of psychopathological phenomena by drugs is a field much cultivated of late years; by it our knowledge of the functional capacities and responses of the brain is being enlarged. Other papers, here included, indicate the mutual dependence of neurology and psychiatry, and their common use of the principles so brilliantly divined and laid down by Hughlings Jackson.

MEDICAL RESEARCH IN SHANGHAI

IN his introduction to the report of the first full working year of the Henry Lester Institute of Medical Research in Shanghai, the director, Dr. H. G. Earle, briefly discusses the principles which guide the work of the Institute as a whole, and which have persuaded him to organise the division of medical research into three categories—clinical, physiological, and pathological. In the division of clinical research, interest has been centred upon diseases with a definite nutritional basis or which lend themselves to biochemical investigation on the clinical side. On the surgical side peptic ulcer, appendicitis, and urinary infections are being investigated, supplemented by experimental work into the underlying physiological and pathological processes. In the division of physiological sciences, Chinese diets and foodstuffs have been analysed in regard to vitamin and mineral content. Chinese drug terminology is being studied as it applies to modern medicine, as well as the toxic effects of chaulmoogra salts upon the liver and the reputed diuretic and antipyretic properties of Chinese perilla. In the division of pathological sciences, typhoid, cholera, the bionomics of the mosquito, and the natural history of schistosomiasis—all of which have a water factor—receive attention. A comprehensive study has been made of the distribution of blood groups among the Chinese population in Shanghai, and the material of the associated Lester Hospital permitted the study of blood tests for syphilis—e.g., the influence of high and low temperatures upon flocculation. But the chief interest of the report lies in the important investigations carried out by the department of epidemiology and medical statistics, a section under the immediate supervision of the director. A wide-scale hospital survey—one of the greatest voluntary collective investigations so far attempted—has provided valuable and fundamental data relating to disease-incidence in various parts of China. Hospital populations are usually regarded as providing but a poor index of disease-incidence by reason of the selective factor, but in China, hospitals perform in high degree the duties usually undertaken by general practitioners in other countries, and in this survey a uniform method has been adopted of collecting and classifying data for in- and out-patients treated in scattered hospitals. The survey has stimulated a spirit of inquiry and investigation among many medical workers; it has shown what are the clinical problems with which hospitals have to contend, and had already increased the general stock of knowledge about incidence and distribution of disease in China. Though this work has been discontinued so far as the Institute is concerned — although the machinery is being used in the other divisions—the *National Health Administration of China* will continue a modified survey on the same lines. The Institute is devoting much effort to popularising research through the medium of public lectures and demonstrations; during the session 1933–34 something like 50 lectures and demonstrations were given in the theatre of the Institute, many of them being illustrated by photographic and cinematographic records produced in its laboratory. These are some examples of what is being done by a well-staffed and liberally equipped institution. Copies of the report, and of papers published by members of the staff, are available on application to the registrar, Lester Institute of Medical Research, Avenue Road, Shanghai, China.

THE ONION AS A SOCIAL PROBLEM

IN the laboratory of applied physiology at Yale University, H. W. Haggard and L. A. Greenberg[1] have been trying to find why an alliaceous odour persists in the breath after eating onions or garlic. It is generally supposed that, like ether, alcohol, and acetone, the essential oil of onion passes into the blood stream and is aerated from the blood in the lungs, so passing into the expired air. Alternative possibilities are that these oils are secreted into the saliva or that the smell comes from the stomach by way of the œsophagus. Haggard and Greenberg will have none of these hypotheses, and they seem to produce conclusive evidence in favour of their own explanation. Their initial experiment was to give 1·5 g. of raw garlic, chewed and swallowed in the ordinary way and followed by the usual odours for a day or more. The same person then took the same quantity chopped in small particles but enclosed in gelatin capsules. No smell whatever was detected in the breath, except once when the subject belched three hours after taking his dose. The investigators thence passed to quantitative tests, where we need not follow them. But all the results go to show that they are right in thinking that the continuing smell of onions or garlic in the breath arises solely from particles retained in the mouth. These particles cannot be completely removed by mechanical means: to brush the teeth and tongue, to wash the mouth with soap and water or even with a 30 per cent. solution of alcohol, will not deodorise the breath. Haggard and Greenberg however are able to propose a remedy which is in fact effective—namely, the rinsing of the mouth with a solution of chloramine, which liberates free chlorine in the mouth and so quickly and completely removes the offending odour. They suggest that many cases of foul breath from other local causes are probably amenable to the same simple treatment, and we hope this may be so. It is salutary, however, to remember the story of the American millionaire who, stimulated by advertisements, spent a large sum on a cure for halitosis; only to find afterwards that his friends did not like him anyway.

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[1] Hughlings Jackson Memorial Volume. Edited by Prof. Ladislaw Benedek. 1935.

[1] Jour. Amer. Med. Assoc. 1935, p. 2160.

A BASE-LINE FOR ASTHMA TREATMENT

For asthma there are many remedies but no fundamental cure. While the first task of an asthma research clinic should be to investigate the cause and the mechanism of the disease, it can scarcely avoid an attempt, at once, to assess empirically the value of some well-known therapeutic measures. Since none of these is strikingly and regularly effective, and since the disease is variable in severity and erratic in course, this can be done only from the records of large series of cases adequately controlled. Such a study is under way at the Guy's Hospital asthma clinic, two workers [1] from which have just published, by itself, their series of controls. The group consists of 127 asthmatic out-patients treated by the ordinary general measures—namely, the removal of the most obvious allergens like feathers and orris root, and the prescription of the indispensable ephedrine and adrenaline—together with a weekly subcutaneous injection of normal saline. *On this régime* of hygiene, symptomatic remedies, and deception half of them lost or nearly lost their asthma for two months. In a further four months a quarter of these had relapsed. The experiment was to be continued for a year, but the results at the end of the second six months are not given. When complete the observations will form a useful yardstick with which to measure the value of such things as vaccines, protein injections, and—possibly the coming favourite—gold. As they stand, they throw into relief the frequency of temporary improvement in the asthmatic after a visit to a new doctor who shows a special interest in him. This phenomenon is familiar to all who treat such patients. It is easily interpreted as the effect of a new remedy but in fact it is usually no more than evidence that "mind and morale play so large a part in asthma."

ACROSS THE FRONTIERS

Many workers in science, and especially in medicine, get an additional satisfaction from their profession because it is super-national. The pursuit of knowledge and the relief of pain are forms of endeavour containing the germ of a world order: they advance coöperation instead of hindering it, and they make the need for it gradually plainer to all. The past few years have led many men and women in many countries to make sacrifices for their faith in institutions beyond those countries. By mitigating the hardships these people have suffered we can if we wish show belief in the unity of the scientific world; and we have ready means of doing so by support of the Academic Assistance Council established in this country "for the relief of suffering and the defence of learning and science." Under the presidency of Lord Rutherford that council has pursued for more than two years its attempt to help university teachers and investigators displaced on grounds of religion, political opinion, or race, and the successful use of its resources is apparent in the second annual report just issued.[1] These resources remain regrettably slight, and the Council has depended, and still depends, on small subscriptions. Such subscriptions however pull more than their financial weight, since their number "demonstrates general support for the principles of university freedom which the work of academic assistance attempts to defend."

THE ACTION OF TETANUS TOXIN

In a leading article last week we stated the current belief that the toxin of tetanus enters the central nervous system through peripheral nerve-endings and travels up the axons of the motor nerves. But according to Abel, Hampil, and Jonas,[2] of Johns Hopkins University, this belief is no longer tenable. At present it is generally supposed that voluntary muscles cannot be tetanised until the toxin has been conveyed by the nerves to the anterior horn cells of the spinal cord; when these cells have absorbed the toxin they pass into an over-excitable state and respond more vigorously to kinæsthetic and other sensory impulses, so that a steady stream of motor impulses to the respective muscles keeps them in a state of tonic rigidity. The Baltimore investigators now show that the toxin can be injected in doses of 1/50 to 1/17 of a lethal dose into the trunk of the sciatic nerve of a dog without exerting any action, either local or central, while even larger quantities can be injected intravenously without effect. If the toxin is injected directly into muscles, on the other hand, amounts as small as 1/200 m.l.d. will suffice to tetanise them; and from these and other observations Abel and his colleagues deduce that tetanus toxin has a very powerful direct and specific action on voluntary muscles whose motor nerve terminals are intact—this action being strictly peripheral, like that of curare. They rightly point out that certain well-established facts appear to stand in the way of this theory. For example, when the nerves of a tetanised limb are transected its muscles will relax immediately and completely if they have not been in a state of increased tone for more than a few days; conversely, the muscles of a limb whose nerves have all been completely transected cannot be tetanised to the slightest degree by injecting them with an amount of toxin that will cause the muscles of a sound leg to become completely rigid and remain so for weeks and months. These objections, the investigators think, cannot be sustained in the light of the newer methods which they have used in nerve transection experiments. But for details of these further experiments we are obliged to wait until later papers are published.

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[1] Conybeare, L. T., and Witts, L. J.: Guy's Hosp. Rep., 1935, lxxxv., 138.

[1] Academic Assistance Council, Rooms of the Royal Society, Burlington House, London, W.1. Treasurer: Prof. M. Greenwood, F.R.C.P., F.R.S.

[2] Abel, J. A., Hampil, B., and Jonas, A. F., Jr.: III. Further Experiments to Prove that Tetanus Toxin is not Carried in Peripheral Nerves to the Central Nervous System. Bull. Johns Hopkins Hosp., June, 1935, p. 317.

RE-ESTABLISHMENT OF A FRACTURE CLINIC

THE governors of Guy's Hospital have decided to re-establish the fracture clinic there. At the present time cases of fracture are dealt with in various departments: a small proportion goes to the orthopædic department, a few which require open operation are treated by the general surgeons, the remainder falls to the care of the two operating registrars. After-care is a matter for the house-surgeons of the four surgical firms. Under the new arrangement all ambulant cases will be treated at the fracture clinic which will have a permanent junior staff consisting of orthopædic registrar, surgical registrar, orthopædic house-surgeon, and sister in charge of the massage department. Two meetings will be held each week, attended alternately by the senior assistant surgeon and the orthopædic surgeon, who will take charge of the cases attending on their own days. On the third day the surgical registrar will deal with urgent cases to be transferred later to the surgeon sitting at the next clinic. Cases requiring admission will be taken into the hospital under the surgeon of the week; on their discharge they will attend the fracture clinic unless the surgeon under whose care they have been in hospital wishes to continue his supervision. It is a defect of the scheme that the surgeon in charge of the clinic has nothing to do with the care of fractures in the wards, and it may be hoped that this will come later. In the meantime the arrangements for after-care with provision for graduated work will help to shorten the period of incapacity, of which the systematic follow-up will afford a measure of control.

LYDIA RABINOWITSCH

THE death of Frau Lydia Rabinowitsch-Kempner at her home in Berlin at the age of 63 removes one of the few remaining links with Robert Koch, in whose laboratory she did her early researches on the tubercle bacillus and allied organisms. The daughter of a Jewish merchant, she was born at Kovno, and received her early medical training in Zurich and Berne, going on to lecture at the women's medical college in Philadelphia in the winter and to work in Koch's laboratories in the summer. Her first published work (1897) was on a saprophytic acid-fast bacillus which she found in 60 per cent. of samples of butter taken in Berlin. She then turned her attention to tuberculosis in animals, and published a series of investigations, some of them in conjunction with M. Koch, carried out in the Berlin zoological gardens. This work included some of the earliest work on the avian strain of tubercle bacillus, on spontaneous tuberculosis in wild animals, on hereditary transmission through the eggs of birds, and on Johne's disease. She became editor of the *Zeitschrift für Tuberkulose*, which has stood in the forefront of German research on this subject for many years. One of her last contributions to tuberculosis research was (1927) a typically careful record of work done on the filtrable virus of the tubercle bacillus. But tuberculosis was not the only subject on which she worked with success. When Robert Koch returned from Africa she worked on the trypanosomes under his direction, and in 1902 she went to study the plague epidemic in Odessa with Walter Kempner, another of Koch's assistants, whom she had married four years before. On Koch's death she went to work under Orth at the Pathological Institute, and continued there until her appointment as director of the bacteriological department of the municipal hospital in Berlin-Moabit. Lydia Rabinowitsch will be remembered not only as a pioneer of bacteriology and one of the ablest of Koch's assistants, but as one of the first women bacteriologists. This was recognised by the conferment on her in 1912 of the title of professor.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. W. J. Colborne to *Rodney*; T. N. D'Arcy to *President* for course; T. Madill to *Orion*; and C. N. Ratcliffe to *Pembroke* for R.N. Hospital, Chatham.

Surg. Lt.-Comdrs. H. G. Wells to *Drake* for R.N.B.; A. C. Paterson and E. J. Mockler to *Pembroke* for R.N.B.; and R. Russell to *Dryad*.

Surg. Lts. W. M. Greer to *Galatea* and F. M. Duthie to Woolwich.

ROYAL NAVAL VOLUNTEER RESERVE

Proby. Surg. Lt. E. J. S. Woolley to *Ramillies*.

Mr. W. H. Green, of Dartmouth, has been appointed Admiralty Surgeon and Agent for Dartmouth. The following appointments as Admiralty Surgeon and Agent have been approved, to date July 24th: Mr. L. P. L. Firman-Edwards, Ryde; Mr. H. S. Taylor-Young, Salisbury; Mr. R. M. Gordon, Witham, Essex; Mr. R. F. Winckworth, Taunton; and Mr. J. H. Harley Gough, Chichester.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. H. V. Stanley, M.B.E., M.C., retires on ret. pay.

Maj. & Bt. Lt.-Col. W. K. Morrison, D.S.O., to be Lt.-Col.

Maj. E. Percival, D.S.O., M.C., to be Lt.-Col.

SUPPLEMENTARY RESERVE OF OFFICERS

Lt. F. H. Williams to be Capt.

TERRITORIAL ARMY

Capts. A. M. Robertson and E. W. Ashworth to be Majs.

G. Garrett (late Offr. Cadet, Liverpool Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS

Maj. W. Simpson, from Active List, to be Maj.

ROYAL AIR FORCE

Wing Comdr. J. M. Aloysius Costello, M.C., is placed on the retired list.

Squadron Leader H. McW. Daniel to No. 101 (B) Squadron, Bicester, for duty as medical officer.

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: E. Cotter and J. M. Shah, M.B.E.

Lts. to be Capts.: J. Edis-Myers, T. K. White, R. de Soldenhoff, C. J. Hassett, R. R. Prosser, E. Parry, W. G. Kennedy, and P. I. Franks.

B. F. B. Russell (substituted for the notifns. in the Gazettes of Jan. 25th and March 15th, 1935).

The undermentioned officers retire: Lt.-Col. V. B. Green-Armytage and Lt.-Col. H. Hingston.

INDEX TO "THE LANCET," VOL. I., 1935

THE Index and Title-page of Vol. I., 1935, which was completed with the issue of June 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

SUPPLEMENT TO THE LANCET

THE
INTERPRETATION OF RETICULOCYTE REACTIONS

THEIR VALUE IN DETERMINING THE POTENCY OF THERAPEUTIC MATERIALS, ESPECIALLY IN PERNICIOUS ANÆMIA

By GEORGE R. MINOT, M.D., S.D., F.R.C.P.E.
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(From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Department of Medicine, Harvard Medical School, Boston, Mass.)

Introduction

In the blood stream of normal man very few of the red blood-cells present evidence of immaturity. Although the nucleated red blood-cells of the bone-marrow are never seen, except occasionally in the first few days of life, a small percentage (not over 1 per cent. in adults) of the circulating cells show a bluish network when brilliant cresyl blue is used as a vital dye. The appearance of this precipitated material has earned for such cells the name of "reticulocytes."

With markedly increased bone-marrow activity a few nucleated red blood-cells may appear in the peripheral blood. The leucocytes and blood-platelets may also be increased, with a shift towards an immature formula for the leucocytes. Under these circumstances the number of reticulocytes in circulation is invariably increased. When blood production is only slightly augmented, however, reticulocytes may appear in the blood stream without being accompanied by nucleated red blood-cells. In chronic hæmolytic anæmias increased blood production with increased numbers of reticulocytes may be present over many weeks or even a lifetime. In anæmia due to acute blood loss an orderly rise of reticulocytes in the circulating blood begins, reaches a maximum, and ends within a few days after the hæmorrhage. On the other hand, even with severe anæmia due to diminished blood production in the bone-marrow, the reticulocytes may be no more numerous than normal. If, however, the cause of the diminished bone-marrow activity is removed, there may be a pronounced temporary rise of reticulocytes as the bone-marrow is permitted to respond to the existing anæmia. In pernicious anæmia in relapse, as a result of liver or allied therapy, a similar increase of reticulocytes in the circulation is observed, associated with progressive maturation of the immature cells of the bone-marrow. The general characteristics of the response of the reticulocytes under these circumstances resemble those of the recovery from acute blood loss, in which condition also there is a demonstrable increase in the activity of the blood-forming tissue.

These facts, taken with other evidence, make it clear that the reticulocyte is not a degenerating form but is a stage in the development of the red cell intermediate between the nucleated and the fully adult type. The natural or induced fluctuations of the numbers of these cells in the peripheral blood stream have been used as a satisfactory measure of the activity of the bone-marrow or as a criterion of the effectiveness of certain therapeutic agents in anæmia. The description and interpretation of these so-called reticulocyte responses with particular reference to pernicious anæmia is the object of this communication.

Types of Reticulocyte Response

The rate of blood production in the normal individual is probably regulated by the oxygen tension in the bone-marrow. In the normal individual reticulocytes in increased numbers appear in the blood stream as a result of bone-marrow anoxæmia whether due to high altitudes, chronic carbon monoxide poisoning, or deficient, pulmonary gas exchange. In various types of anæmia the reticulocyte response, whether to acute hæmorrhage, increased red cell destruction, the removal of toxic inhibition of the bone-marrow, or the administration of certain substances in the nutritional deficiency anæmias, is in reality a physiological response to the lowered oxygen tension produced by the anæmia. Liver extract, iron, or, for example, vitamin C, although specifically effective in certain anæmias, do not produce reticulocyte responses in normal individuals or in types of anæmia in which there is no lack of such substances available within the body. Thus, these substances do not act as stimuli to the bone-marrow in the strict sense, but merely permit increased or normal maturation of the red blood-cells. The real stimulus in each instance is the diminished oxygen tension produced by the anæmia.

An increase of the number of reticulocytes in the peripheral blood stream does not, however, necessarily mean an increased delivery of red blood-cells by normal physiological processes from the bone-marrow. Thus, for example, in the progressive anæmia of metastatic carcinoma, of miliary tuberculosis of the bone-marrow, or of leukæmia, the presence of the abnormal cells either acts as an "irritant" to the erythroblastic tissue or else the gross amount of this tissue is so much reduced by invasion that despite the increased activity of the remaining erythroblastic tissue, indicated by increased numbers of nucleated and reticulated erythrocytes in the peripheral blood, the total number of erythrocytes produced is less than normal. The effect of splenectomy in increasing the number of immature cells, including reticulocytes, in the circulation is a variable and not well-explained phenomenon. In any type of anæmia, especially in the "crises" of hæmolytic anæmias in which the bone-marrow is active, continued reticulocytosis or a sudden increase of these cells does not necessarily herald a significant increase of the total red blood-cell count. If an increased degree of blood destruction or a sudden hæmorrhage occurs, the increased activity of the bone-marrow may be insufficient to make up the deficit of blood.

Moreover, it does not necessarily follow that a reticulocyte response to the administration of certain substances is an index of orderly and progressive physiological activity such as occurs after liver extract or iron therapy in certain anæmias due, respectively, to deficiency of one or the other substance. The administration of many substances, especially by the parenteral route, may lead to an outpouring of reticulocytes and even of nucleated red blood-cells. In general such reactions are erratic and do not usually conform in amount or in time to the characteristic responses resulting from the replacement of a specific nutritional defect. Thus, in the past, foreign proteins, nuclein derivatives, or crude extracts of various tissues, when given by injection, have been claimed to possess specific hæmatopoietic powers because of the subsequent appearance of nucleated erythrocytes or other immature cells and increased numbers of erythrocytes in the peripheral blood stream of normal animals or man. The fact that such responses occur in normal animals or man clearly differentiates the action of such substances from that of liver extract or iron, both of which are effective *only* in anæmias due in whole or in part to their lack. The fact, however, that liver extract given to patients with atypical anæmias or leukæmias, especially by injection, sometimes causes a reticulocytosis, does not exclude the possibility either of an associated deficiency of the substance effective in pernicious anæmia or of a non-specific response to other substances in the relatively crude sources of active material at present available. It is certainly not necessary to conclude that the principle active in pernicious anæmia is producing the effect in some novel fashion.

Potassium arsenite (Fowler's solution) serves as an excellent illustration of a substance which can produce non-specific reticulocyte responses in man. Its oral administration in sufficient quantity will produce such effects in normal individuals, in myelogenous leukæmia, and in pernicious anæmia.[1 2] Moreover, potassium arsenite will depress the leucocytes in myelogenous leukæmia[3] and in normal individuals, and depress the red blood-cell in polycythæmia vera.[4] In pernicious anæmia the reticulocyte responses to the daily administration of potassium arsenite differ in character from those caused by liver extract therapy in that there is not usually a smooth increase and decline in the number of circulating erythrocytes within a period of a few days. Instead, the maximum value of the reticulocytes may be irregularly maintained for several weeks and the total duration of the reaction may be even longer. In further contrast to the specific replacement therapy, there is not an orderly progressive alteration of the age of the reticulocytes towards more mature forms as the days go by. Instead, the number of distinctly young reticulocytes continues to be approximately the same and may be accompanied by showers of nucleated red blood-cells. Moreover, despite this apparent furious activity of the bone-marrow the total red blood-cell count may not rise appreciably or may rise only after a delay of from two to four weeks. By giving as much as 150 minims of Fowler's solution within two days, however, it is possible to contrive a reticulocyte response that resembles rather closely that produced by liver extract in pernicious anæmia. It is possible, however, to show that in pernicious anæmia at the end of many days of elevated numbers of reticulocytes as the result of the administration of potassium arsenite, a complete and typical reticulocyte response to liver extract may be obtained as soon as the reticulocyte response to the arsenic has subsided[2] (see Fig. 1).

It is difficult, therefore, to believe that the action of liver extract and that of potassium arsenite are identical. Since it is even more difficult to believe that pernicious anæmia is a disease due to a deficiency of arsenic, it is evident that the reticulocyte response alone cannot be utilised uncritically as a test of specific physiological activity. Particularly with parenterally administered substances are non-specific effects of various sorts likely to be exhibited. Our own experience has been that preparations containing protein derivatives and known to be inert when orally administered in pernicious anæmia may upon parenteral administration produce reticulocyte responses in certain patients and little or no response in others. The effects originally reported by Morris and his associates[5] from the injection of concentrated gastric juice and more recently analysed by Fouts, Helmer, and Zerfas,[6] very possibly illustrate the same principle. The reticulocyte responses and increases of red blood-cells observed were decidedly more variable in their character and time of onset than would be expected from the parenteral injection of liver extract. In contrast to these phenomena, the reticulocyte responses induced by an acute hæmorrhage in normal man or, for example, by liver extract in pernicious anæmia indicate by their regularity and typical characteristics the physiological activity of the bone-marrow. In each instance if the cause of the anæmia is not re-established respectively by further bleeding or by lapse of the supply of liver extract, the patient's blood becomes and remains normal.

Characteristics of the Reticulocyte Reaction

Reticulocyte responses to the administration of specific substances have been observed in anæmias due to deficiency of liver extract,[7 8 9] iron,[10] and vitamin C.[11] The first of these conditions has received the largest amount of study. The reticulocyte responses in Addisonian pernicious anæmia will be especially discussed below. Subsequent references to liver extract refer to preparations possessing in common with desiccated stomach an effect in pernicious and certain other macrocytic anæmias and not in iron-deficiency anæmias. In addition of course whole liver contains other substances, for example, those effective in hypochromic anæmia (iron and "secondary anæmia" fraction), and in the anæmia of scurvy (vitamin C). The features of the reticulocyte reaction when observed under controlled circumstances are sufficiently uniform to justify certain generalisations. In this communication the percentage, and not the absolute number of reticulocytes in the peripheral blood, will be used as the basis of the discussion. By reference to the total red blood-cell count, the absolute number of reticulocytes can always be calculated. In the interpretation of the reticulocyte responses several factors must be evaluated on the basis of daily reticulocyte counts and frequent determinations of the red blood-cell level.

There are certain general features of the reticulocyte reaction in pernicious anæmia which obtain, whether the active material is given orally or parenterally, in a single large dose or in small uniform daily dosage, provided the amount of material given is sufficient to produce a significant increase of reticulocytes. Almost always within a period of from two to ten days the percentage of the reticulocytes in the

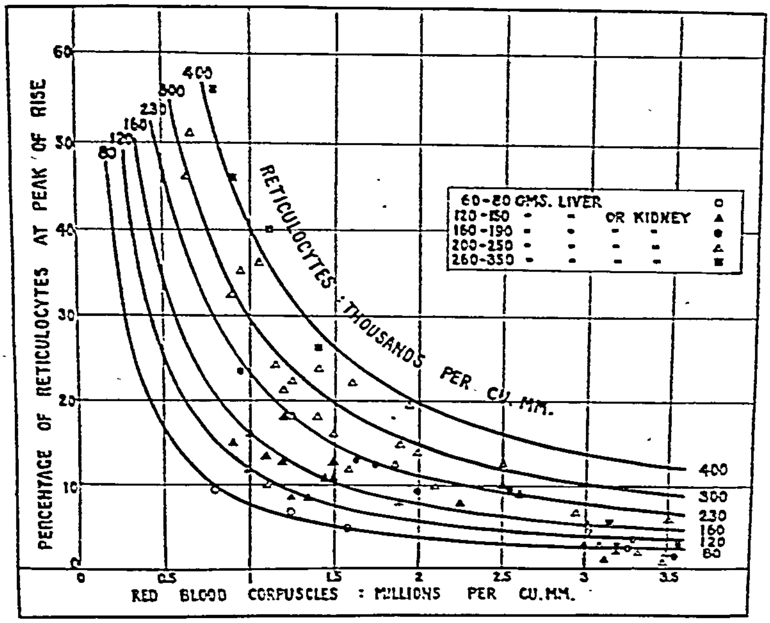

FIG. 2.—Height of the reticulocyte peaks in the responses of individual cases of pernicious anæmia to the daily administration of the amounts of liver or of kidney indicated plotted against the red blood-cell level existing at the beginning of treatment. Note that there is an inverse relationship between the red blood-cell level and the height of the reticulocyte response, and a direct relationship between the latter and the amount of material administered. (From Minot, Murphy, and Stetson.[7])

peripheral blood begins to increase and progresses regularly to a maximum value within a period of from three to ten days thereafter. Then the reticulocyte percentage declines steadily over a period of time, usually somewhat longer than that taken for the increase, until it returns to a level close to its original value. When the reticulocyte counts are averaged from observations on several patients given similar amounts of active material, an approximately triangular course or varying height and width is usually observed. The peak reticulocyte value may be approximately the same when determined by single counts on two successive days. More frequent counts near the maximum of the curve often show slightly higher intermediate values which restore the acute apex of the triangle. During the reticulocyte response the age of the reticulocytes, as judged by the amount and character of the granular filamentous substance, shows a progressive transition identifiable as a metamorphosis from young to older forms. Characteristically the increase in the total red blood-cell count may be accounted for up to the peak of the reaction by the increment of reticulocytes. Thereafter, with continued therapy, the red blood-cells increase largely as a result of the delivery of mature erythrocytes. With reticulocyte responses due to small amounts of effective material, the total red blood-cell count may be little increased or may even fall slightly, owing perhaps to an increase of blood volume or to the natural progress of the disease. Indeed, the amount of active principle necessary to cause a maximal reticulocyte response may be less than that required to produce a maximal rate of rise of the red blood-cells. This difference is due to the fact that daily oral doses of material derived from 300 to 400 g. of liver may in individual instances produce apparently maximal reticulocyte responses but a less than maximal rate of rise of the red blood-cells. Analysis of the results obtained in many patients, however (see Fig. 4), demonstrates that, on the average, to produce maximal reticulocyte responses a larger dose is necessary (material derived from 600 g. of liver).

In *uncomplicated* cases given what have been considered maximum amounts of potent material, the red cells rise *on the average* at very nearly the same rate, no matter whether the substance is given intravenously, intramuscularly, or by mouth. In four weeks the red blood-cells increase, on the average, from the vicinity of 1·4 million per cubic millimetre, by about 2·5 million or slightly more. To be sure, in a series of cases selected at random the average increase of red cells for those given material parenterally will be slightly greater because some of the cases treated orally may have difficulty in absorbing or utilising the material from the gastro-intestinal tract, and because the parenteral dosage commonly used tends to be supramaximal.

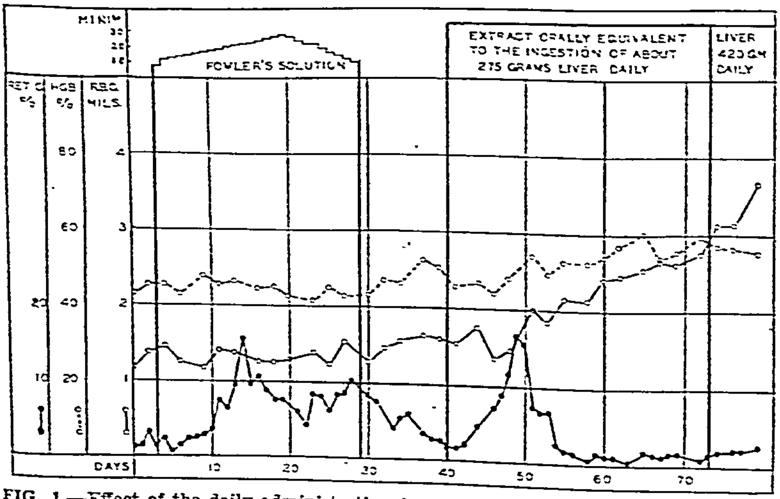

FIG. 1.—Effect of the daily administration in pernicious anæmia of Fowler's solution (potassium arsenite) followed in a subsequent period by liver extract. The reticulocyte response to Fowler's solution, although irregularly maintained for over twenty days, is not associated with a significant increase of the red blood-cells or of the hæmoglobin. The subsequent orderly reticulocyte response to liver extract is typical in time of onset and duration, and is followed by a rapid rise of the red blood-cell count characteristically exceeding the rate of hæmoglobin production, so that the colour-index becomes normal, then less than normal.

In pernicious anæmia, as the red blood-cells rise in response to the administration of active principle, their increase in number frequently outstrips the rate of hæmoglobin regeneration and the changes in physical character of the red blood-cells. An increased mean corpuscular volume becomes normal or less, and the mean corpuscular hæmoglobin concentration and colour-index tend to fall, sometimes below normal values. Somewhat the reverse of this process occurs in the response of hypochromic anæmia to iron. Here, the hæmoglobin regeneration proceeds more rapidly than the increase of the red blood-cells, especially as the latter are frequently not greatly diminished as compared with the hæmoglobin. As the colour-index increases, the decreased mean corpuscular hæmoglobin concentration rises and the low mean corpuscular volume, which may increase very rapidly during the reticulocyte response, eventually becomes normal.

In pernicious anæmia there is evidence that the blood-platelets may be increased somewhat earlier than the reticulocytes, and that in general the diminished white blood-cell count is increased towards normal or slightly above in a variable relation *to the reticulocyte response. It is worth noting* that the patient may sometimes be subjectively improved or show slightly more colour in the hands or face before any changes in the reticulocytes have appeared and frequently before the total red blood-cell count has risen. Likewise the plasma bilirubin may decline sharply as the reticulocytes increase.

The details of the onset, duration, course, and amount of the reticulocyte reaction in pernicious anæmia depend particularly upon (1) the initial red blood-cell level; (2) the amount of active material given; (3) the portal of entry to the body; (4) the rate at which the material enters the body; and (5) the reactive state of the bone-marrow. In the ensuing discussion each factor will be considered in turn, with the assumption that the other four are average and uniform. In the actual interpretation of a given response all the factors must be evaluated.

EFFECT OF THE INITIAL RED BLOOD-CELL LEVEL

If a large uniform daily dose of active material is given to each of several patients with pernicious anæmia, an inverse relationship between the peak value of the reticulocytes and the initial red blood-cell count is observed.[7] This fact is shown by the data plotted in Figs. 2 and 3. *The relationship between the initial red blood-cell level and the maximal percentage value of the reticulocyte response* holds irrespective of the source of the material or the method of its administration. It is, of course, not proper *to compare the absolute values of the reticulocyte peak* produced with one type of material or method of administration with those produced by another, but the same material given in identical dosage demonstrates the inverse ratio. In patients with over 3 million red blood-cells per cubic millimetre, the reticulocyte responses become variable and may not appear despite a significant effect upon the total red blood-cell count. It is probable that under these circumstances the demand of the anæmia upon the bone-marrow is not sufficient to cause delivery of immature cells into the blood stream, or that the proliferation of the primitive red blood-cells in the bone-marrow is not sufficient to provide a large amount of tissue for rapid maturation.

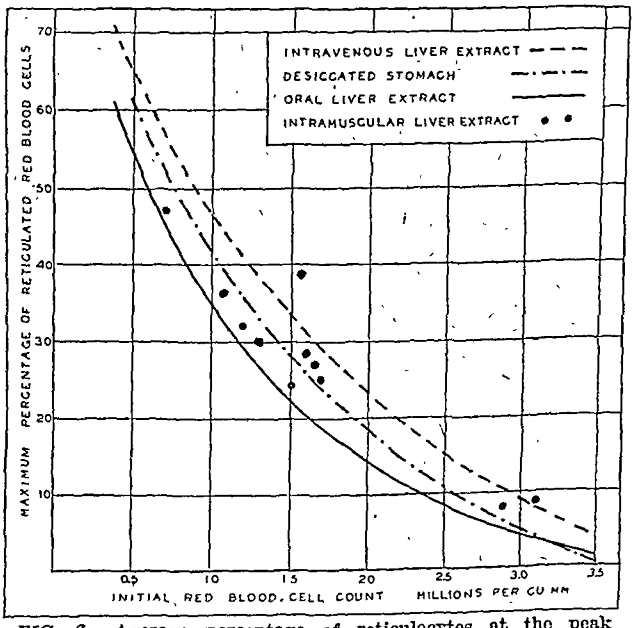

FIG. 3.—Average percentage of reticulocytes at the peak of their rise in response to different types of maximally effective therapy in pernicious anæmia plotted against the initial red blood-cell count. From above downwards the curves indicate average responses from single intravenous injections of extract derived from 100 g. of liver, from the daily oral administration of material derived from 265 g. of *pig's stomach, and from the daily oral* administration of extract derived from 600 g. of liver, respectively. The solid dots indicate the individual responses of 11 patients given daily by intramuscular injection extract derived from 10 g. of liver. (Based on figure by Bethell and Goldhamer.[13] Some of the *data for* intramuscularly administered liver extract were kindly supplied by Dr. Raphael Isaacs.)

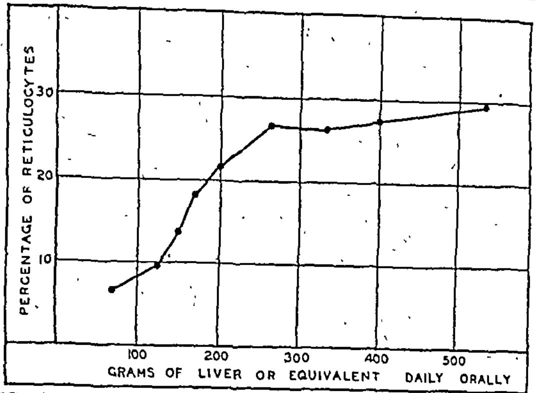

FIG. 4.—Relationship between the dosage and the height of the reticulocyte response to the daily oral administration of liver or of liver extract in a hypothetical case of pernicious anæmia with an initial red blood-cell level of 1·25 million per c.mm. The data are derived from observations with liver pulp or with a liver extract conserving about two-thirds of its potency in 99 patients with *initial* red blood-cell levels of between 1 and 2 million per c.mm. The expected responses in the hypothetical patient with an *original red blood-cell* level of 1·25 million per c.mm. were calculated when necessary by interpolation, using the slope of the curve shown in Fig. 2 most closely approximating the data of each observation. *The averages so obtained from the daily administration* of the amounts of liver or equivalent extract indicated are shown by the individual points on the line.

EFFECT OF THE AMOUNT OF POTENT MATERIAL

If to each of several patients with pernicious anæmia and the same initial red blood-cell level various amounts of effective material are administered in uniform daily dosage, it appears that there is a direct relationship between the amount of material given and the peak of the reticulocyte value. This effect, however, approaches a maximum at a decreasing rate as the amount of active material is increased, as shown in Fig. 4. Thereafter an increase of the amount of active material produces no greater increase of the peak value of the reticulocytes but may accelerate the rate of increase of the red blood-cell concentration. In Figs. 2 and 3 are shown the effects of the administration of various amounts of liver [7] and other potent substances for oral or parenteral use [12, 13] upon the production of reticulocytes. Table I. shows the approximate amounts of various sources of active material for oral or parenteral use which may be expected to yield just maximal reticulocyte responses upon uniform daily administration in uncomplicated cases.

EFFECT OF THE ROUTE OF ADMINISTRATION OF POTENT MATERIAL

The effectiveness of liver extract when rectally administered is very slight compared with its activity upon oral administration, according to a few observations. If the same amount of a given active material is administered in uniform daily doses by mouth and by intramuscular injection in patients with comparable degrees of anæmia, striking differences in the effectiveness of the material are observed. The most accurate comparisons have been made between the effectiveness of the daily oral administration of the liver fraction "G" of Cohn and of the daily intramuscular injection of a dilute aqueous solution of the same material. Although the data are scanty, it is evident that the effect of the daily oral administration of this extract derived from 600 g. of liver is usually no greater than the effect of the daily parenteral administration of the same material derived from 10 g. of liver.[13] Data from certain observations leading to this conclusion are plotted in Fig. 3. It is, therefore, probable that material administered by the parenteral route is at least sixty times as effective as when given by mouth to the average patient. In certain patients, owing possibly to difficulty in the absorption of orally administered material, this ratio is apparently increased. The existence of an intestinal barrier is probably to some extent a physiological phenomenon in regard to the absorption of material in liver extract, iron, and other substances. Whether in certain patients with pernicious anæmia increased difficulty in absorption entirely accounts for the relatively slight effects of the usual oral doses of liver extract has not been finally established (see Fig. 5). There is evidence that the effectiveness of equal amounts of liver extract given intramuscularly in different patients is also variable. Since it is not known with certainty that effective parenteral preparations of gastric tissue can be made, there is no evidence concerning the relative effectiveness of this material when administered by injection.

EFFECT OF THE RATE OF ADMINISTRATION OF POTENT MATERIAL

The rate at which the active principle reaches the bone-marrow evidently produces certain modifications in the reticulocyte response. In general the effect of a single massive dose of orally[15] or parenterally[16] administered material is to accelerate the appearance of increased numbers of reticulocytes in the blood stream and to increase the peak value. The tendency for large uniform daily doses of material to cause earlier reticulocyte responses than smaller doses also acts in a similar way.

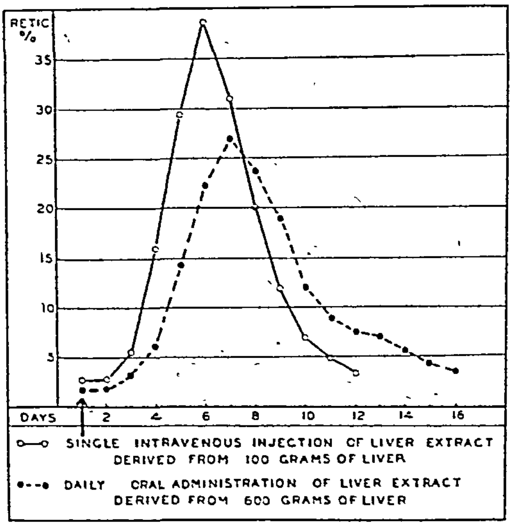

FIG. 6.—Average daily percentage of reticulocytes in patients with pernicious anæmia responding to maximally effective amounts of liver extract administered by a single injection (13 cases) and in uniform daily doses by mouth (20 cases). The average red blood-cell level before treatment for each of the two groups was about 1·2 million per cubic millimetre. (From Minot.[11])

On the contrary, the daily administration of small doses of active principle tends to produce a prolonged low curve with a delayed and not very acute apex. In the case of parenterally administered liver extract, perhaps especially when given intravenously in a single large dose, there may be an additional non-specific or irritant effect possibly augmenting the production of reticulocytes by the bone-marrow, since of course the commercial extracts so far available are far from being pure sources of the active principle.

In Fig. 6 are shown the average daily percentages of reticulocytes resulting from maximally effective amounts of liver extract given intravenously in a single dose and in uniform daily doses by mouth respectively to each of two groups of patients with pernicious anæmia with initial red blood-cell levels in the vicinity of 1·2 million per cubic millimetre. There is a difference of about 42 per cent. in favour of the intravenous injections when the percentages of reticulocytes at the peaks of their rises are compared. If the sums of the daily percentages of reticulocytes above the level of 5 per cent. are calculated, there is still a difference of 17 per cent. in favour of the intravenous injections. By multiplying the daily percentage values for the reticulocytes by the total number of red blood-cells, however, the absolute number of reticulocytes present at each observation can be calculated.[17] When this is done, sums of the daily numbers of reticulocytes poured forth above the basal level of 60,000 per cubic millimetre of blood are found to be, within 1 per cent., the same for each method of administration.[18] Whatever the physiological implications of these facts, it is apparent that in evaluating reticulocyte responses from percentage data for peak values, identical methods of administration must be used. Otherwise certain calculations must be performed with absolute values.

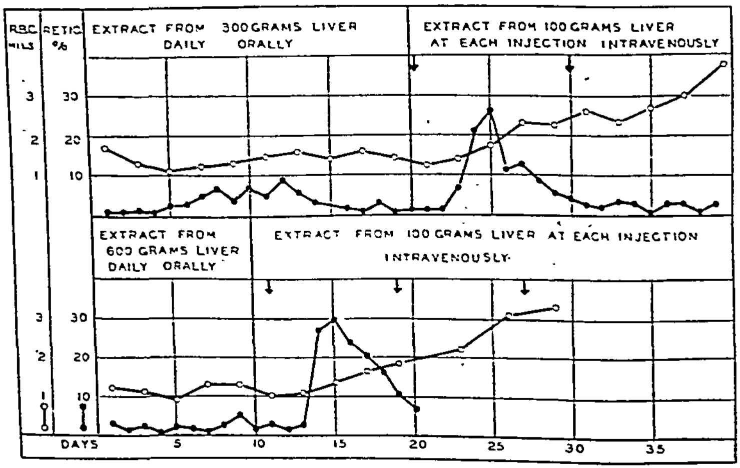

FIG. 5.—Comparison of the effectiveness of a liver extract upon oral and parenteral administration in two cases of macrocytic anæmia. In the upper part of the figure is shown the relatively slight reticulocyte response and effect upon the red blood-cell level produced by the daily oral administration of a liver extract derived from 300 g. of liver, followed by a striking response to a single intravenous injection of the same material derived from 100 g. of liver.

The lower part of the figure shows the negative response in a second patient to the daily oral administration of an extract derived from 600 g. of liver, followed by a striking reticulocyte and red blood-cell response after a single intravenous injection of the same material derived from 100 g. of liver. Note, however, that the peak of the reticulocyte response (30 per cent.) to the latter is not so great as would be expected (47 per cent.) according to the values shown in Fig. 3. This fact suggests that the failure of the patient to react to the orally administered material is not due entirely to difficulty with absorption, but depends to some extent upon ineffectual internal utilisation. (Upper figure from Castle and Taylor: Jour. Amer. Med. Assoc., 1931, xcvi., 1198; lower figure from Castle, Heath, and Strauss: Amer. Jour. Med. Sci., 1931, clxxxii., 741.)

EFFECT OF THE REACTIVE STATE OF THE BONE-MARROW

The discussion so far has been based on the results obtained in the average patient with pernicious anæmia. In addition to a consideration of the foregoing factors, it is necessary to recognise the fact that certain patients are more or less able than the average subject to develop a reticulocyte response. Thus patients whose initial level of reticulocytes is in the vicinity of 5 to 8 instead of the usual 1 to 3 per cent. may be expected to respond more readily but to give less marked increases at the peak. In general older persons and those with arterio-sclerosis respond less readily than younger ones. Extensive neurological involvement is often associated with slightly lower reticulocyte responses. Severe damage to vital organs, such as the liver, is prone to inhibit reticulocyte responses. By analogy with other anæmias it is clear that toxic factors, such as may be associated with nitrogen retention, may act in a similar way. Infection of a variety of types may greatly inhibit the reticulocyte response. In Fig. 7 is shown the temporary depressing effect of an intercurrent infection upon the bone-marrow response of a patient with pernicious anæmia already responding to liver extract. Difficulty with the absorption of material from the alimentary tract, although not strictly concerned with the reactive stage of the bone-marrow, may, as discussed above, be responsible for lessened reticulocyte responses or even for their absence in certain patients (see Fig. 5).

Theoretically, if acute blood loss has occurred shortly before the administration of specific therapy, the pre-treatment blood level will be lower than that naturally corresponding to the state of the bone-marrow; and the effect of the therapy in producing reticulocytes will really correspond to the blood level existing before the bleeding occurred. If a large transfusion of blood has preceded the administration of active principle, the situation will be reversed in an uncomplicated case. If, however, in such a case some degree of iron deficiency existed, the transfusion might allow an especially large reticulocyte response from the administration of liver extract because hæmoglobin would be supplied to the cells in the bone-marrow at the same time as the active principle of liver extract. In many patients there are probably other defects of nutrition besides the deficiency of "liver extract," especially iron deficiency. The reticulocyte response to liver extract, in such cases of atypical pernicious anæmia as have a less increased cell size than usual or some degree of hæmoglobin reduction, may be retarded by the existence of the additional deficiency. Such an effect is apparently common in the anæmia of sprue.

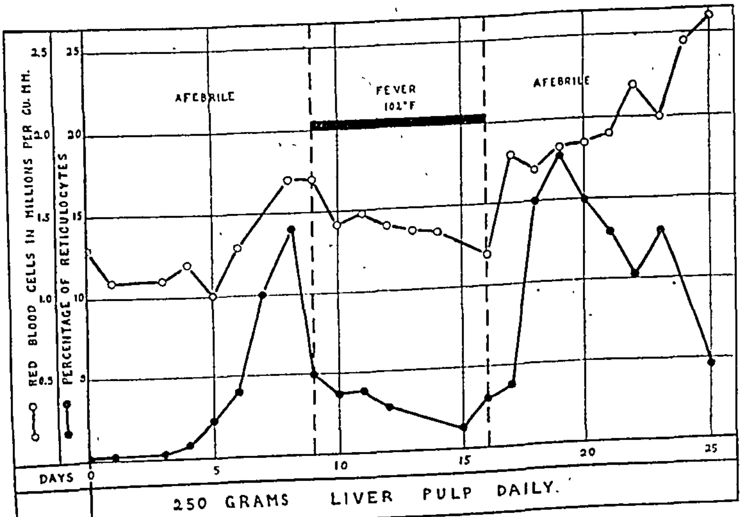

FIG. 7.—Temporary depressing effect of intercurrent infection with fever upon reticulocyte and red blood-cell production during response to the daily administration of liver in pernicious anæmia. (From data kindly supplied by Dr. O. H. Robertson.)

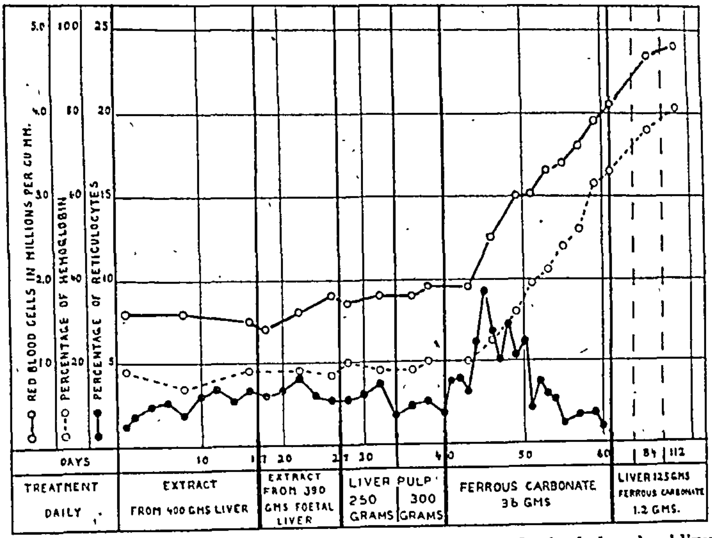

FIG. 8.—Negative effect of calves' liver preparations and of whole calves' liver in "idiopathic" hypochromic anæmia, followed by a positive effect of iron upon reticulocyte production and red blood-cell and hæmoglobin values. (From Mettier and Minot: Amer. Jour. Med. Sci., 1931, clxxxi., 25.)

Use of the Reticulocyte Reaction as a Test of the Physiological Responses of the Bone-marrow

With due attention to the variables involved, the reticulocyte response may obviously be used to ascertain the reactive state of the red cell forming tissue. The presence of increased numbers of reticulocytes, taken with leucocytosis and increases of blood-platelets, is in general a feature of anæmias associated with increased bone-marrow activity. Such a condition exists more or less constantly in chronic hæmolytic anæmias in which toxic depression of the bone-marrow is not present. Exceptions, due to "irritation" of the marrow in the anæmia of leukæmia or of metastatic disease of the bone-marrow, have been mentioned above.

After an acute hæmorrhage, the height to which the reticulocytes will rise depends on the amount of blood lost and the ability of the marrow to react. Accurate data from animal experiments have recently been published,[19] showing that there is a striking quantitative relationship between the reticulocyte response and the amount of blood lost. Equally good data are not available in man, but unpublished data in our hands indicate that in general the principle has been well established qualitatively. If, after a considerable hæmorrhage, the reticulocytes do not show a wave-like increase, the presence of some deficiency, often of iron, due to previous hæmorrhage or to long-standing defective diet or nutrition, may be hypothecated. Based on these principles, numerous examples of the value of daily observations of the reticulocyte percentage at critical times might be cited. A diagnosis of unsuspected intestinal hæmorrhage may be made as a result of finding the reticulocytes considerably elevated in a patient who has suddenly become weak for no obvious reason. Occasionally chronic carbon monoxide poisoning may be correctly diagnosed because of increased reticulocytes in the presence of a normal red blood-cell and hæmoglobin level.

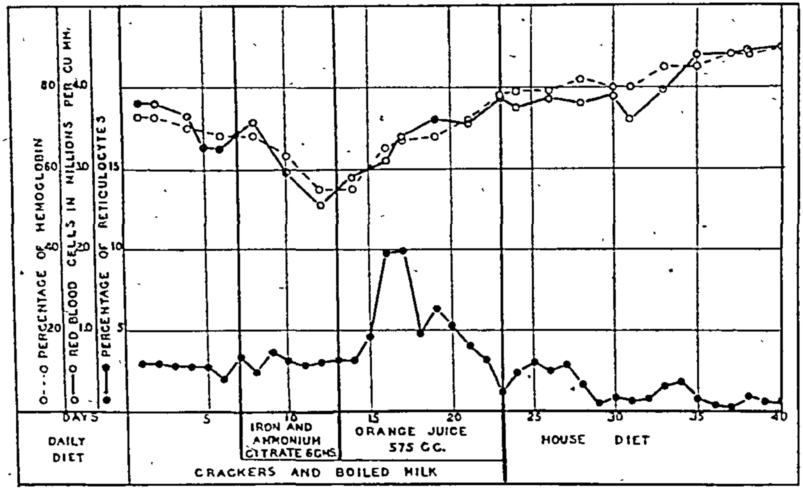

FIG. 9.—Negative effect of the daily administration of iron in a patient with anæmia and scurvy. Note the subsequent reticulocyte response to orange juice and the increase of blood values. The patient was kept on a vitamin-C deficient diet during these observations. (From Mettier, Minot, and Townsend.[11])

In the analysis of the physiological basis of various types of nutritional deficiency anæmias, daily observations of the course taken by the reticulocytes probably constitute the best single criterion. During successive ten-day to fifteen-day periods certain sources of active material are administered in uniform daily doses known to be maximally effective in typical instances of various types of deficiency anæmia.

Thus, in definitely anæmic patients the failure of a reticulocyte response to appear after the parenteral injection of liver extract, or after the oral administration of iron or of orange juice, may be taken to indicate that there is not a deficiency of these substances. Thus the diagnosis, for example, of pernicious anæmia, iron deficiency anæmia, or the anæmia of scurvy, respectively, would be excluded. On the other hand, reticulocyte responses in one or more such successive periods of observation may indicate the respective degree of participation of such factors in the cause of the anæmia. In Fig. 8 is shown the negative effect of liver preparations and of whole liver, respectively, in successive periods of administration in hypochromic anæmia. Finally, the reticulocytes increased with iron therapy and there was a rapid rise of red blood-cells and hæmoglobin. In Fig. 9 is shown the reticulocyte response of a patient with a blood picture resembling very much that of pernicious anæmia. As is seen, the patient while kept on a vitamin-C deficient diet did not respond to iron therapy but showed a typical reticulocyte rise consequent upon the administration of orange juice. The ineffectiveness of purified liver extracts has been shown in other patients with the anæmia of scurvy under similarly controlled conditions. Fig. 10 illustrates the participation of both a deficiency of "liver extract" and a deficiency of iron in the production of anæmia responding with successive reticulocyte reactions to the administration of each of these substances. The blood picture was moderately hypochromic and the response to liver extract unexpectedly revealed the complexity of the deficiency.

The presence of "resistance" to the oral administration of liver extract may be demonstrated by the method of successive test periods. In the lower portion of Fig. 5 is shown the absence of a reticulocyte response in a patient given liver extract derived from 600 g. of liver daily, and the presence of an excellent reticulocyte response to a single intravenous injection of liver extract derived from 100 g. of liver in a subsequent period. Ideally, the observation should have been carried out by the subsequent uniform daily parenteral injection of extract derived from 10 g. of liver in order that the amounts and rates of administration of active principle in each period would be comparable.

Finally, the removal of toxic inhibition of the bone-marrow due to the presence of infection may be demonstrated by following the daily course of the reticulocytes after the elimination of the infection. In Fig. 11 is shown the effect of removing the parasites in a patient with malaria. The temporary increase of reticulocytes, following treatment with quinine, indicates the effect on the bone-marrow of abolishing the inhibition due to fever or in some manner to the presence of the malarial parasites. Had the hæmolytic process only been abolished, the reticulocytes would merely have declined without the distinct elevation after the successful treatment for malaria.

Use of the Reticulocyte Reaction as a Test of the Potency of Therapeutic Agents

SINGLE RETICULOCYTE RESPONSES

Although there are now promising methods for the testing of the material active in pernicious anæmia by the use of animals, the patient is the basis of the present methods for establishing the effectiveness of experimental or commercial products. Despite

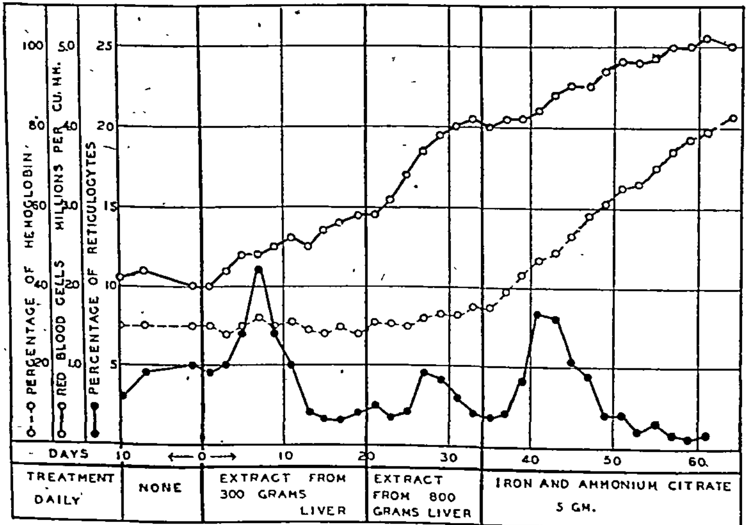

FIG. 10.—Effect of liver extract and of iron in successive period of daily administration in a patient with normocytic anæmia with a moderately low colour-index. Note the three reticulocyte responses: the first from a liver extract ordinarily ineffective in hypochromic anæmia but effective in pernicious anæmia; the second from an increase in dosage; and the third in response to iron therapy. The dominant effect of the liver extract in increasing the red blood-cell count and of the iron in increasing the hæmoglobin level is clearly shown.

much that has been written, it is evidently not clear to many physicians how such tests should be conducted. Therefore the technique of using the single and the "double" reticulocyte reaction method for the determination of the potency of therapeutic substances will be described.

The use of the reticulocyte reaction as a test of comparative potency is applicable only to substances already known from their general clinical and hæmatological effects to be specific.

With substances whose regular clinical effectiveness is not clearly established (e.g., Fowler's solution), a reticulocyte response does not necessarily mean a replacement of a specific deficiency. Especially with parenterally administered substances the possibility of non-specific effects (e.g., concentrated gastric juice) is to be considered. Even with parenterally administered liver extracts, especially in large intravenous dosage, a partial non-specific effect upon reticulocytes may occur. For this reason it is preferable to administer therapeutic substances in uniform daily dosage, and if parenterally, by intramuscular injection. Under any circumstances if a large reticulocyte response appears without a significant increase of the red blood-cells a non-specific effect is to be suspected. Thus if a new product is to be considered effective, not only must it produce an appropriate reticulocyte response, but an appropriate increase of red blood-cells must follow. However, distinctly submaximal dosage of material *known to be clinically effective* will produce a small reticulocyte response for the given blood level, and a significant increase of the red blood-cells may not follow because the quantity given was small.

The reticulocyte response has certain advantages over the method of observing the rate of rise of the total red blood-cell count.

In the first place, it is a more delicate test because reticulocyte responses can be detected following doses of material quite insufficient to produce a distinct increase of red blood-cells. In the second place, if the red blood-cell count is used, it is necessary to allow a much longer period of time to elapse than if the reticulocyte reaction is studied. With the former a period of at least a month is desirable; with the reticulocyte response, ten to fourteen days is almost always sufficient. In either case controlled dietary conditions must be maintained, since the patient's ability to utilise certain foods for the formation of effective material through his own gastric mechanism may be present or especially may return during the induced remission.

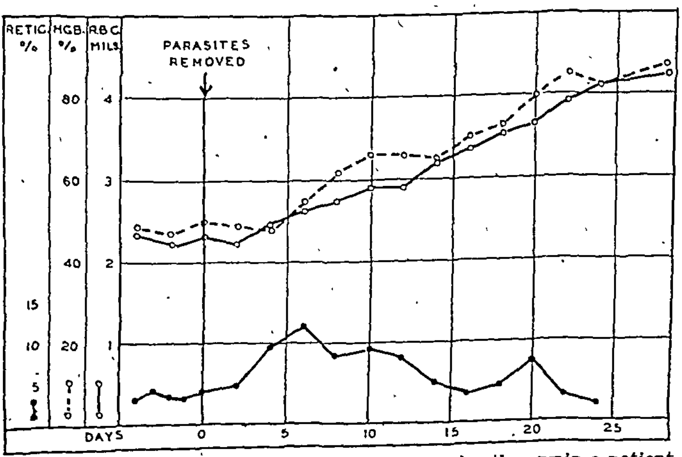

FIG. 11.—Effect of removal of parasites with quinine therapy in a patient with hæmolytic anæmia due to malaria. Note the temporary rise of reticulocytes indicating removal of the inhibition of blood production. This increase of reticulocytes would not have occurred had only blood destruction been abolished.

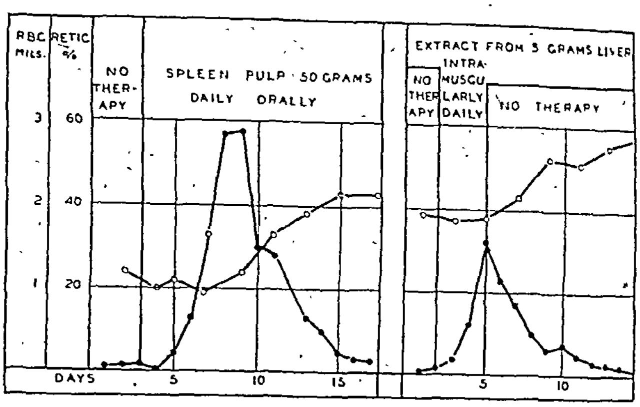

FIG. 12.—Reticulocyte responses in two patients with pernicious anæmia beginning too soon after the initiation of the method of therapy used to be a result of it. The reticulocyte response to spleen pulp began on the second day of administration; and the material was subsequently shown to be ineffective in other patients. The reticulocyte response to the daily intramuscular injection of liver extract began within 24 hours and was actually a typical response to active material subsequently discovered to have been ingested by the patient six days previously.

When the rise of the red blood-cells is used, the prolonged period is necessary because of the variable interval after the initiation of therapy at which the response begins. Therefore, in order to secure a good estimate of the rate of rise, it is necessary to determine the result over a considerable period. Moreover, the rise of the red blood-cells occurs at a constantly diminishing rate which makes comparisons with different initial red blood-cell values somewhat difficult. Thus, for example, what may be considered an excellent rise in a month from a level of 3 million would be considered an unsatisfactory rise from a level of 2·8 million per cubic millimetre. Finally, the data concerned with the rate of rise of the red blood-cells under controlled conditions have not been so carefully worked out as those concerned with the reticulocyte response.

An objection which applies both to the use of the rise of the red blood-cells and to the use of a single reticulocyte response for evaluating the potency of material is the fact that the results obtained from observations on several patients must be treated statistically in order to eliminate individual variations. By the use of the method of the double reticulocyte response, it is possible to compare in the same patient the effect of one or more substances and so largely avoid the effect of variations in individual susceptibility. In view of the present scarcity of suitable patients and the well-recognised variability of different individuals in their responses, especially to orally administered material, this method has overwhelming advantages.

Before proceeding to a discussion of the double reticulocyte phenomenon, it should be mentioned that data are available for the use of the single reticulocyte peak under certain defined and *adequately controlled* conditions. The factors involved in the reticulocyte reaction have been discussed in detail above, and average values for the expected results, in respect to reticulocyte response (see Figs. 2 and 3), have been given.

The most common error in the use of such data has been the failure to determine what amount of the substance to be tested is just sufficient to produce maximal or slightly submaximal effects upon reticulocytes. In the Table are shown the average amounts of various therapeutic agents yielding just maximal reticulocyte responses. Obviously, considerable losses of potency may occur and remain undetected if supramaximal dosage is employed. Thus, for

Table showing Approximate Daily Amounts of Substances Necessary to Produce Maximal Reticulocyte Responses in Pernicious Anæmia

Substance.	Original weight in grammes.	Prepared weight or volume.	Route of administration.
Liver or kidney [7]	500	400 g.	Oral.
Desiccated hog stomach [12]..	250	30 g.	,,
Liver extracts— Aqueous concentrate [14] ..	500	65 c.cm.	,,
Precipitate 95% alcohol: fraction "G" [8]	600	27 g.	,,
Dilute solution of fraction "G" [13]	10	2 c.cm.	Im.
Concentrated solution of fraction "G" (commercial)	20	0·6 c.cm.	,,
Liver-stomach preparation [22]	20	4·5 g.	Oral.

Im. = Intramuscular.

example, in testing the effectiveness of a given product for oral use expected to be just maximally effective in daily amounts derived from 400 g. of liver, the daily dose employed in testing should be that derived from not more than 400 g. of liver. Secondly, particularly in regard to the reticulocyte reaction, the necessity for uniform methods of administration has been neglected, perhaps because the importance of this feature of the test has not been sufficiently realised.

The best data available are based either on the uniform daily administration of potent substances or on equal injections of liver extract at intervals of either a week or ten days. It is clear that, in order to compare results upon reticulocytes, the methods of administration must be uniform.

As indicated above, the effect of a single large dose of material or of a single intravenous injection is to produce a somewhat greater percentage of reticulocytes at the peak of their rise than the same dose of material evenly distributed over several days. Sums of the daily numbers of reticulocytes produced during the period of elevation by each method of administration are about the same. Errors in determining the number of red blood-cells or the percentage of reticulocytes will multiply the final error. Obviously, under these conditions irregular and variable dosage renders it impossible to make satisfactory comparisons. It is thus easier to arrange beforehand for a uniform method of administration best suited to the standard data available and to compare simply the peak percentage value of the reticulocytes. Usually this is best effected by giving a uniform daily dose until the reticulocyte peak has been passed. By continuing the administration, the rise of the red blood-cells at the end of thirty days can be used as a check.

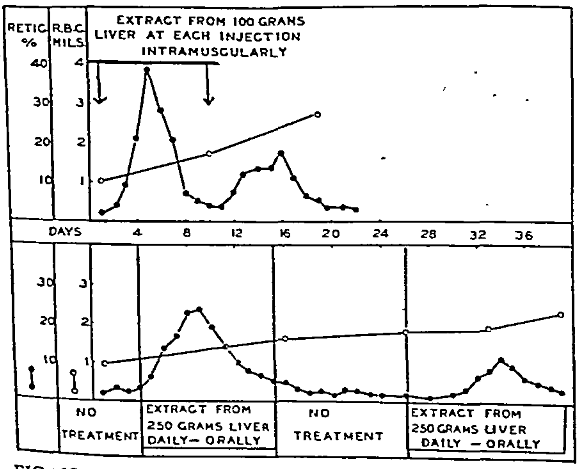

FIG. 13.—Effect upon reticulocyte production in pernicious anæmia which may occur with discontinuous therapy even when equal amounts of active substance are used. Under these circumstances the appearance of the second reticulocyte response obviously does not indicate the greater potency of the second substance administered.

If a given uniform daily dosage of a certain preparation is just sufficient in the average patient to produce a maximal reticulocyte response, it cannot be assumed that reduction of the dosage will have a proportionately diminished effect in producing reticulocytes. Since there is a diminishing rate of approach to the maximal effect upon reticulocyte production as the dosage is increased (see Fig. 4), the peak value produced by one-half the maximal dose will not be one-half, but more nearly three-quarters that expected from the maximal dose. It is therefore impossible to draw quantitative conclusions as to the relative potency of different sources of active principle by comparing in a "mathematical" fashion the percentages of reticulocytes produced. Comparisons are best made on the basis of the determination of the amounts just sufficient to produce maximal effects.

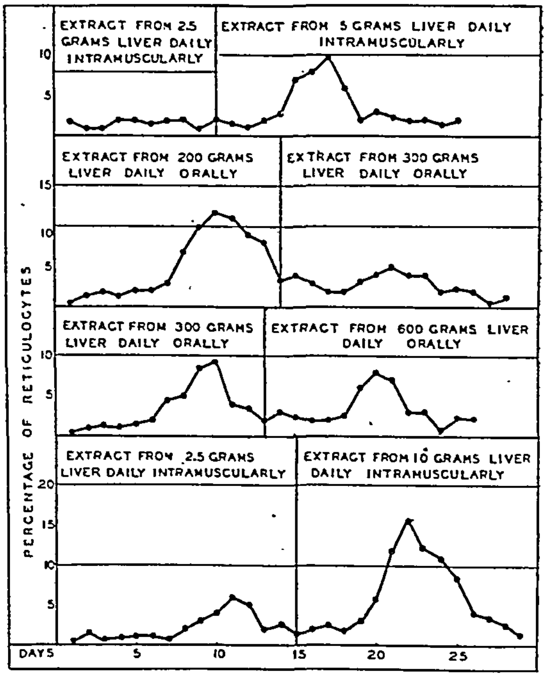

FIG. 14.—Observations of "double" reticulocyte responses in each of four patients with pernicious anæmia. In the first patient there was actually no reticulocyte response in the first period. In the other three patients reticulocyte responses, respectively less than, approximately equal to, and greater than the first reticulocyte response appeared in the second periods. The significance of each complete observation is the same: the substance given during the second period was of greater potency than the substance given during the first period.

It is the glory of the medical profession that it is untiring in the service of suffering mankind, but the doctor's humane impulse to "get the patient well" is often oblivious to the austere necessities of scientific observation during the attainment of that desirable objective. The conduct of a controlled observation upon reticulocyte production demands that the improvement be measurable, not haphazard. The patient will benefit from treatment no less because its effects are critically examined, and his future security and that of other patients suffering from the same disease may depend upon information concerning the potency of the remedy so obtained.

Remarkable as it may seem, attention to such *obvious details* as the elimination of other sources of active material than the substance under test, or of the complications introduced by blood transfusion or previous therapy, has not always been observed. Thus, it is essential that the patient has not recently received active material or is not receiving it in the diet during the test, in the form of liver or kidneys. If a certain amount of gastric intrinsic factor remains, potential sources of liver extract exist in the form of dietary (extrinsic) factors, such as meat, eggs, whole grains, yeast, and probably other substances. For this reason the diet of the patient should not contain such substances during observations. A control period of a few days is desirable in order to establish the constancy of the reticulocyte level and thus the uniformity of the reactive state of the bone-marrow before the administration of active material.

The following examples serve to emphasise the importance of paying scrupulous attention to the character of the reticulocyte response, especially in respect to its time relations to the test substance.

In Fig. 12 are shown two striking reticulocyte rises immediately following *but not due to administration of the substances indicated.* The response in the first patient to orally administered spleen pulp began within two days; that in the second patient to the intramuscular injection of a liver extract began within twenty-four hours. Such rapidly developing effects upon reticulocyte production are never seen under these conditions of administration; both responses were therefore considered to be unrelated to the therapy indicated in Fig. 12. Subsequent observations with spleen pulp demonstrated its complete negativity; and this reticulocyte response has not been explained except as "spontaneous." The second patient was subsequently found to have taken a considerable amount of an effective commercial preparation before coming under observation, on the sixth day preceding the beginning of the reticulocyte response.

Unfortunately, examples of similar atypical reticulocyte responses have appeared in the literature as evidence of the potency of commercial products.

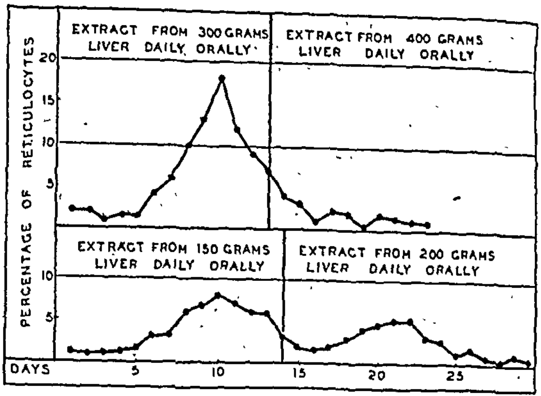

FIG. 15.—In the upper part of the figure the relatively large dosage of liver extract (one-half maximal) given a patient with pernicious anæmia has yielded only a slightly submaximal reticulocyte response, and thus prevents a second reticulocyte response when this dosage is increased by one-third. In the lower part of the figure the reticulocyte responses of a second patient to a proportionate reduction of each dosage are shown. During the first period an increase of reticulocytes appeared in response to about one-quarter of the maximally effective dose of liver extract and was then followed by a second reticulocyte rise when this dosage was increased by one-third, as in the first patient.

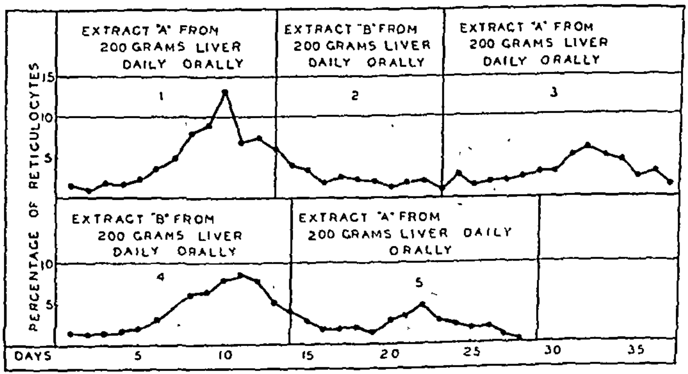

FIG. 16.—Effect of reversing the order of administration of two liver extracts for oral use in pernicious anæmia, an extract A of unknown potency and a standard extract B. Extract A represents a lot of material manufactured according to a process designed to produce material of the potency of standard extract B. It is known that a maximal reticulocyte response can be obtained from the daily oral administration of standard extract B derived from 600 g. of liver. One-third of this dosage is chosen in order to yield a definitely submaximal effect upon reticulocytes. At the end of periods 1 and 2 no conclusion is possible; at the end of period 3, extract A has been found to produce a reticulocyte peak subsequent to the administration of standard extract B derived from an equal amount of whole liver. It is therefore shown to be of greater potency than standard extract B. In a second patient reversal of the order of administration employed in periods 1 and 2 of the first patient is made in periods 4 and 5; and, as in periods 2 and 3, extract A is shown to be of greater potency *in terms of original liver than standard extract B.*

"DOUBLE" RETICULOCYTE RESPONSES

The method of the double reticulocyte response demands careful attention to detail, but since the variations of different individuals are eliminated and the standards derived from other observations are not critically involved, its interpretation is relatively simple. The principle of the method depends on the fact that the uniform daily administration of a source of active material, large or small, will never produce more than one reticulocyte response unless the *reactive state of the patient intermittently changes.* If during a period of from ten to fourteen days active material in distinctly submaximal quantity is given in uniform daily dosage, a less than maximal reticulocyte response will appear and decline. Now, if during a second period of days a distinctly greater quantity of the same material is given in uniform daily dosage, a second reticulocyte response will usually result. The technique of conducting such observations and their interpretation will now be considered in detail in reference particularly to pernicious anæmia. The examples cited, however, serve to illustrate certain points common to the use of the reticulocyte reaction not only in responses to liver and allied products but in responses to hæmatopoietic substances in any type of deficiency anæmia.

Necessity for the Uniform Daily Administration of Potent Material.—If an effective amount of potent material is administered *in a single* oral dose or injection, a *reticulocyte* response will appear. If, however, later than five days thereafter an identical amount of the same material is administered in the same way, a second, usually smaller, reticulocyte response may occur (see Fig. 13). Since the *second* dose of the material was exactly as potent as the first, this indicates *that* in the interval the effect of the first substance was "wearing off," and that the bone-marrow was at least partially ready to respond again. For the same reason if an interval is allowed to elapse between two periods of the uniform daily administration of equal units of active material, a *second* reticulocyte peak may be produced (see Fig. 13). A corollary to this situation would be the administration of daily but variable doses of material, since with such a procedure, as with discontinuous therapy, the effect on the bone-marrow would be to some extent variable also. It is evident, therefore, that the "stimulus" to the bone-marrow should in theory be continuously and evenly applied. In practice this can best be done by giving either by mouth or by injection a uniform daily dose of the active principle to be tested. Naturally the route of administration—oral or parenteral—must be the same in both periods of observation.

Necessity for Submaximal Dosage of Potent Material.—If a maximally effective amount of active principle is given continuously during the first period, it is obvious that the bone-marrow will not be able to respond further to an immediately subsequent daily administration of more potent material. Under the conditions defined, a twofold or even a threefold increase of the amount of active principle has no additional effect. Therefore, in the conduct of the double reticulocyte reaction, *it is necessary to know from other observations what will be a daily submaximal dose of the substance under test.* In order to allow the greatest opportunity for a second reticulocyte response due to the administration of material of potentially greater activity in the second period of observation, it is desirable to use in the first period of observation a dose just sufficient to produce a distinct reticulocyte reaction; from a quarter to a third of the maximal dose is usually satisfactory. With such dosage the possibility of a second increase of reticulocytes is facilitated.

Positive Significance of a Second Reticulocyte Response.—If, following the administration of a substance in the first period, there is during a second period an orderly response of reticulocytes, no matter of what degree, to a second substance, this substance is known to be more potent than the first. It is emphasised that this conclusion is justified whether or not there was a reticulocyte response during the first period and whatever the relative magnitude of the reticulocyte response in the second period. Fig. 14 shows in the second periods of four different cases reticulocyte responses of various heights relative to the responses in the first periods. Each is indicative of the greater potency of the second substance. If the absolute numbers of reticulocytes are calculated, the effect of the rise of the total red blood-cell count will be to increase the relative height of the second reticulocyte peak, but its significance will not be altered. It is, of course, essential that the peak of the first reticulocyte response has definitely been passed before the administration of the second substance is begun. The administration of the second substance should never be begun until there have been at least two days on which reticulocyte percentages lower than the peak value have been obtained; and it is advisable to determine that the reticulocyte percentage on the third day is also lower than that on the two preceding days before commencing the administration of the second substance on the third day. It is not advisable to wait until the previous base line has been reached, since this allows an opportunity for too great an increase of the red blood-cell values. There will always be a latent period during the early days of the administration of the second substance before the beginning of the second reticulocyte response. During this time the reticulocyte increase due to the first substance will be further diminishing.

Negative Significance of the Absence of a Second Reticulocyte Response.—If following the administration of a substance in the first period there is during the administration of the second substance no second reticulocyte response, the only conclusion that can be drawn is that the second substance was not shown to be more potent than the first. It is possible that the second substance was merely not sufficiently more potent than the first to produce a second reticulocyte response. Since in order to produce a second response a certain increment of potency is essential, especially at relatively high blood levels, *it is never proper to assume, under these circumstances, that the second substance was less potent than the first,* although this may well be the case. Since the greater the first reticulocyte response the less is likely to be the second, it may be possible to demonstrate, by proportionately reducing the dosage of each substance when given to a second patient (and so producing a smaller first reticulocyte response), that the second substance was actually slightly more potent than the first. Fig. 15 illustrates this point. Because of this fact, in general, the dosage of the first substance given should be as small as possible and still produce a distinct first reticulocyte rise.

Reversal of the Order of Administration.—If there is no second reticulocyte response, especially when the first reticulocyte response has been small, it is possible to decide whether the second substance is less potent than the first by reversing the order of their administration in another patient. Under these circumstances, the absolute or relative dosage of each should be that employed in the first patient. If, in the second patient, a second reticulocyte response is forthcoming, the failure of the second reticulocyte response to appear under the original order of administration is clearly explained; as now the first substance given the first patient has been shown in the second patient to be the more potent. If no second reticulocyte response appears in the second patient, it is clear that neither substance is detectably more potent than the other. By readministering the first substance in the same dosage in a third period in the original patient, the reversal of order may be effected without the use of a second patient. Examples of the results of reversing the order of administration of two sources of active principle are shown in Figs. 16 and 17.

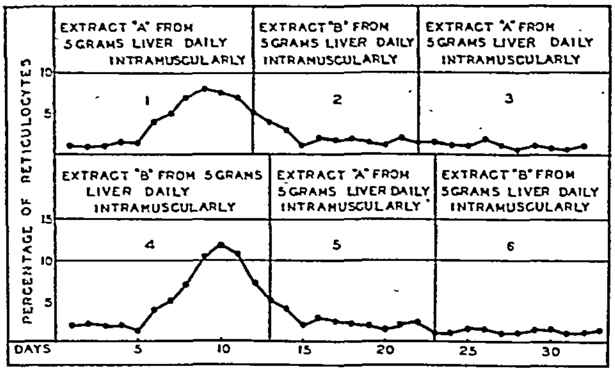

FIG. 17.—Effect of reversing the order of administration of two liver extracts for intramuscular use in pernicious anæmia, an extract A of unknown potency and a standard extract B. Extract A represents a lot of material manufactured according to a process designed to produce material of the potency of standard extract B. It is known that a maximal reticulocyte response will be obtained from the daily intramuscular injection of standard extract B derived from 10 g. of liver. The first patient presenting an opportunity for a test has considerable arterio-sclerosis and therefore a relatively large submaximal dose, that derived from 5 g. of liver, is given daily. At the end of periods 1 and 2 no conclusions can be drawn. At the end of period 3, since no reticulocyte response appeared, no final conclusion can be drawn. Although it may be suspected that extracts A and B are about equal in potency, the patient's blood values may have risen so much as to prevent a reticulocyte response in period 3. In a second patient the order of administration of similar doses is reversed throughout with the same result. The conclusion is now justified, since neither standard extract B nor extract A is able to produce a second reticulocyte rise after the other, that they are equivalent in potency.

The method of the double reticulocyte response can be most readily utilised when a "standard" substance of known potency is available. Its utility in checking lots of material made by the same process is thus manifest. The substance of unknown effectiveness should be given in the first period in uniform daily amounts derived from that quantity of whole organ which is known, in the form of the "standard," to yield a distinctly submaximal reticulocyte response in suitable patients. If the unknown substance has suffered significant losses of potency in preparation, a reticulocyte rise will occur when the standard material derived from identical amounts of whole organ is given in the second period. If an increase of potency of the unknown over the standard is anticipated, the standard may be given first for obvious reasons. In this case the absence of a second reticulocyte response calls for a reversal of the order of procedure in another patient (see Figs. 16 and 17).

The establishment of standard preparations for both oral and parenteral administration, which could be supplied on demand to those testing products of any sort, would be a considerable advantage in maintaining the potency of material available for physicians to prescribe for their patients. The practice of describing commercial products only in terms of the original amount of liver, stomach, or other tissue from which each is derived, instead of in terms of the residual amount of active principle, leaves much to be desired. Under this system variations in the potency of different commercial products derived from the same amount of original organ have been shown to exist among substances designed both for oral and for parenteral use.[20 21 22] It is therefore desirable that more critical standards be adopted by the medical profession as the basis for accepting commercial products and for labelling their potency. *It is our belief that the reticulocyte method offers the most convenient basis for such determinations.* The description of the acceptable product should indicate what daily amount is just sufficient to produce a maximal reticulocyte response. This amount of material may not be sufficient for maximal red blood-cell production, nor is it necessarily the proper dosage for all patients. Measurement of the reticulocyte response to the uniform daily administration of the product *does not imply* that it should be given in daily dosage in practice but does provide a practical method of determining the effectiveness of a given product under controlled conditions within a few days. The use of the double reticulocyte response provides a means of comparing the potency of material with a standard preparation in the same individual.

Summary

1. The circumstances resulting in the appearance of increased numbers of reticulocytes in the peripheral blood stream of man have been reviewed.

2. The probable non-specific or "irritant" effects upon reticulocyte production of certain substances not supplying a nutritional deficiency have been discussed with especial reference to potassium arsenite.

3. The physiological reticulocytoses resulting from hæmorrhage, blood destruction, removal of toxic inhibition of the bone-marrow, and the supplying of substances necessary for the normal development of the red cell have been discussed.

4. A description has been given of the use of the reticulocyte reaction as a measure of the physiological activity of the bone-marrow in certain types of anæmia.

5. The characteristics of the physiological reticulocyte reaction and its relationship to an increase of the red blood concentration, particularly in response to the administration of material effective in pernicious anæmia, have been defined. A discussion has been given of the influence upon the reaction of certain modifying factors in respect to the administration of potent material and the reactive state of the patient.

6. The use of the reticulocyte reaction as a test for the potency of therapeutic agents in deficiency anæmias, especially by means of "double" reticulocyte responses, has been described.

Conclusions

Determinations of the percentages of reticulocytes in the peripheral blood are of value in estimating the activity of the bone-marrow. Characteristic increases of reticulocytes in response to the administration of certain therapeutic agents, when properly correlated with increase of the blood values, are useful in the diagnosis of nutritional deficiency anæmias and in the determination of the effectiveness of therapeutic agents. The possibility of non-specific effects, especially with parenterally administered substances, must be kept in mind.

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COVENTRY AND WARWICKSHIRE HOSPITAL.—Rapid progress is being made with the appeal for £100,000 for this hospital, and Lord Nuffield has promised to give £25,000 when the city has raised £75,000. Less than £12,000 is now required before he will be asked to fulfil his promise.

EDINBURGH ROYAL INFIRMARY.—A warrant has been granted for the erection of the new residence for the nursing staff of this hospital. It is to be built at the south end of Archibald-place where the entrance to George Watson's College was situated. The building is to be six stories high, and will have accommodation for 280 nurses. Each bedroom is to be furnished with built-in furniture and a wash-hand basin. Adequate bathrooms will be provided, and there are to be two shampoo-rooms on each floor. There are also to be rooms for lectures, studies, and writing. A special feature will be a large recreation-room, measuring 77 feet by 30 feet, which will be in the centre of the building on the ground floor. It is to have two sitting-rooms opening off, one at each end, which are separated from the main room by folding partitions which enable the three rooms to be thrown into one for special functions. The main entrance will be from Archibald-place, and four minor entrances communicate with the hospital. Four electric lifts and five stairways will allow easy exit in case of emergency. The estimated cost of the building is £110,000.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXIV.—PROGNOSIS OF SALPINGITIS

THE peculiar anatomical features, and, perhaps, physiological function of the pelvic peritoneum render the prognosis of suppuration in this region rather different from that of other abdominal abscess formation. The pockets of the pelvis, and probably its more resistant peritoneum, enable infection to be sequestered and pus to be sterilised in many cases of peritonitis which originate from the tubes. Therefore, while there may be no small amount of pelvic invalidism and even acute exacerbation of peritonitis, there is seldom the mortal danger which accompanies abscesses in and around the appendix and gall-bladder.

Non-suppurative Salpingitis

Most cases of acute salpingitis follow gonorrhœa or septic infection at abortion and labour, and, excluding tuberculous infections, there is scarcely any other important cause of salpingitis. The two main varieties of each of these forms are the non-suppurative (or "catarrhal") and the suppurative. The first, or catarrhal variety quickly subsides, leaving no symptoms or physical signs, and may even disappear to such an extent as to leave the tube functionally sound. We are compelled to notice the remarkable powers of complete resolution possessed by the tube because pregnancy has followed undoubted cases of mild salpingitis. The restoration of function obviously depends upon the maintenance of the lumen, and also, we believe, on the integrity of the ciliated epithelium, by which the ovum is propelled towards the uterus. If both ostia are permanently closed the woman must be sterile, and it is probable that any considerable replacement of ciliated epithelium by non-specific epithelium must also be associated with sterility, or what amounts to the same thing—tubal gestation.

Our experience of resolution includes not only cases of the mildest salpingitis which can recover sufficiently to allow a subsequent pregnancy, but even those in which the tubes have been definitely palpable during and immediately after the acute attack. But despite the undoubted occurrence of complete resolution, the fact remains that by reason of its delicate fimbriæ and ciliated epithelium the tube is a vulnerable organ, and its function is easily impaired by the mildest infections. Should the fimbriæ adhere by the most filmy adhesions the orifice will be blocked; and so narrow is the interstitial portion that it must require only the slightest epithelial desquamation to ensure adhesion of the walls and permanent occlusion. We must therefore regard an attack of even mild salpingitis as a serious event in the reproductive life of a woman, which will probably render her permanently sterile. Some months after the attack has cleared up, the functional prognosis can be settled by X ray examination of the pelvis during the injection of lipiodol into the uterus by an intra-uterine syringe. This test will demonstrate effectively not only if the tubes are occluded, but also the site of the occlusion.

IMMEDIATE RESULTS

The immediate prognosis of acute salpingitis is nearly always good, though operation may be necessary for abscess formation or prolonged tubal swelling with continued temperature. The great majority of all gonococcal cases settle down without danger of general peritonitis, but where the tubes become infected after labour the danger of extending peritonitis is greater because, before uterine involution is complete, the tubes are abdominal rather than pelvic organs. Not only is their anatomical situation a potential danger, but the infection may be highly virulent and prone to spread rapidly. In these cases salpingitis is usually only a comparatively minor part of a widespread or generalised infection of far greater importance than the local focus in the tubes. Salpingitis after abortion is less immediately serious as the tubes have not been carried up out of the pelvis by the enlarged uterus, but it is liable to be followed by abscess formation or chronic interstitial salpingitis. The rare occasion on which acute salpingitis follows curettage of the apparently normal but infected uterus is nearly always fatal on account of the severity and rapid spread of the accompanying peritonitis.

LATE RESULTS

The later results which may follow an average attack of acute non-suppurative salpingitis are an important part of the consideration of any given case. The possibilities are: (1) resolution, or, if not complete functional restoration, such disappearance of all active infection as to prevent any further recurrence of signs or symptoms; (2) the formation of a permanently thickened tube with closed abdominal ostium, and containing a small amount of sterile, turbid fluid (interstitial salpingitis); (3) rarely, pyosalpinx or tubo-ovarian abscess of varying size, adhesions, and toxicity; and lastly, (4) hydrosalpinx, which may be a thin-walled sac formed by the tube distended by clear fluid.

The clinical outlook will depend upon the pathological legacy of the acute attack, and to a lesser extent on the manner of life and social status of the patient. Where even mild permanent changes are left, such as thickening of the tube wall, adhesions of the tube, ovary, gut, and uterus, there will be some disability for a varying number of months or years, which will gradually disappear as the tubal condition becomes more and more an obsolete lesion. The disability will take the form of pelvic pain or discomfort caused by fatigue and menstruation. There will probably be some increase of menstrual loss on the first day or two, and leucorrhœa, but on the whole the symptoms are mild and strikingly dependent upon fatigue, overwork, and mental stress. If the woman can live a life of ease she will have little trouble, but if she is a working woman either as the non-salaried, active mistress of her own house and family, or as a regular salaried worker in somebody else's house or factory, she will find that her pelvis is her heel of Achilles. As time goes on, however, and with due care, rest, and symptomatic treatment, the symptoms gradually subside, and the pelvic weakness is forgotten. There is much evidence to this effect to be found during the course of pelvic operations. During laparotomy, done for some other condition, the tubes may be found thickened, closed, and adherent, though there may have been no immediate complaint of pelvic symptoms. The patient has obviously had salpingitis and still carries its final anatomical results, but she has, perhaps, long ceased to know of its existence. The steady, if lengthy, course of improvement is always liable to interruption, however, if the woman is overworked, contracts a "chill" just before or at the beginning of menstruation, or as some evidence shows, develops a severe attack of influenza.

Suppurative Salpingitis

After an attack of true suppurative salpingitis the subsequent course is not so simple. The tube is left as a sealed sac containing pus. The immediate convalescence may require three weeks before the temperature returns to normal, and though the pus may gradually become "sterile" as far as ordinary bacteriological examination can show, yet the patient is very liable, almost inevitably liable, to have repeated exacerbations of symptoms due to recrudescence of local tubal peritonitis. On these occasions the clinical features of the original attack are reproduced, and again one can feel the tender fixed tubal swellings alongside and behind the uterus. Not only will she suffer these repeated attacks of pelvic illness, but during the intervals she will never be really robust and well. She may lose weight and have a toxic appearance, while menstruation will be too frequent, excessive, prolonged, and painful. Secondary conditions, such as anæmia, bacilluria, and metastatic "rheumatic" foci are also possible complications.

PROGNOSIS AFTER OPERATION

While medical treatment will usually succeed in the former group, there is no hope except from operation in the latter group in which "chronic" tubes contain actual pus. It is well, however, to remember that immediate and complete recovery to normal health will not follow the removal of pyosalpinx. If the tubes, and probably infected portions of the ovaries, are alone removed, the patient will certainly lose those symptoms which are the direct outcome of harbouring pus anywhere in the body, but unless the uterus, which is inevitably also infected, congested, and enlarged, is also removed the patient is still left with all the troubles of menstruation and leucorrhœa. It is theoretically conceivable that after the adjacent abscesses have been removed the uterus would gradually return to normal, but in fact the process is either very slow, or else fails entirely, and the patient, even after so remedial an operation as removal of pus sacs, may still find herself a menstrual invalid, with only a few days in the middle of the month of comparatively good health.

Hysterectomy, especially for a young woman, may appear to be too radical, but actually the ultimate results are better, and as the woman would anyhow have been sterile, the operation will not have deprived her of potential child-bearing. If the operator hesitates during the operation, mindful of the youth of his patient, of her recent marriage, maybe, and of the added time and difficulty of hysterectomy—and individual circumstances should always render every decision a special one—he should remember the interstitial portions of the infected tubes, and therefore remove a wedge-shaped piece of the fundus to include them. Convalescence is always prolonged. It may be months, even a year or more before good health is regained. Much, if not all, depends upon how far menstrual symptoms disappear, for it is the oft-recurring depression of health combined with excessive loss of blood which holds her back from complete recovery.

We are often asked about the effect of the operation on *sexual feeling*. Normally, removal of pyosalpinx will not only not depress it, but will actually increase it by improving the general health, but where the ovaries have been sacrificed as a part of suppuration there may be, but by no means necessarily, some gradual fading of sexual feeling. Much depends upon the type of woman. Some women suffer no loss whatever either after the menopause or double oöphorectomy, whereas others find that their sexual life has finished. It is probably safe to say that the outlook in this direction is determined more by the degree of sexual activity and development of the woman than by the surgical deprivation of certain endocrine influences.

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SPECIAL ARTICLES

INTERNATIONAL NEUROLOGICAL CONGRESS

(*Concluded from p. 269*)

Discussions

THE CEREBRO-SPINAL FLUID

IN opening a discussion on the physiology and pathology of the cerebro-spinal fluid, Dr. L. H. WEED (Baltimore) said that in the developing embryo the appearance of the choroid plexuses corresponded with the extraventricular spread of the cerebro-spinal fluid. Whether the fluid was a true secretion or a filtrate depended upon whether the cells of the choroid plexus did work in its formation. Lewis Flexner's investigations supported the view that the fluid was a secretion. Dr. Weed's own researches had shown that the factors influencing the absorption were the difference between the hydrostatic pressure of the fluid and the sagittal venous pressure, together with the osmotic pressure of the blood. In quadrupeds the hydrostatic factor was small and the major effective force was the osmotic pressure of the blood colloids, which was equivalent to 250 to 300 mm. of saline. The Monro-Kellie doctrine that the volume of the cranial contents was constant, though modified in details, was essentially sound.

Prof. G. SCHALTENBRAND (Würzburg) gave an account of the evolutionary history and the anatomical structure of the choroid plexuses, the leptomeninges, the Virchow-Robin spaces, and the arachnoidal tufts. He showed lantern slides illustrating the microscopical changes in the cells of the choroid plexuses, which were believed to be contemporary with the formation of cerebro-spinal fluid. He described the effect of osmotic changes on the circulation of the fluid.

Mr. HUGH CAIRNS (London) discussed the treatment of hydrocephalus. There were at least eighteen causes of hydrocephalus in infancy and it was obvious that an accurate diagnosis must precede effective treatment. Hydrocephalus in adults might be due to a congenital membrane blocking the foramen of Magendie, incision of which afforded relief. The ætiology of otitic hydrocephalus, which sometimes followed otitis media or mastoiditis, was incompletely understood. It was characterised by an increase in the volume and pressure of the cerebro-spinal fluid in which the protein content and cells were abnormally low. Papillœdema was the most important symptom. The condition subsided spontaneously in time, if the patient were treated with repeated lumbar puncture.

Mr. Cairns also spoke on post-operative hydrocephalus following the removal of a tumour from the posterior fossa, cystic loculations of fluid after removal of intracranial tumours, cerebral œdema, and cerebral shrinkage.

Prof. F. Georgi (Yverdon) dealt with the physico-chemical basis of the formation and resorption of the cerebro-spinal fluid. He emphasised the difficulty of drawing a conclusion from the physical and physico-chemical properties of the fluid and equally from the presence in, or absence from, the fluid of hormones or immune bodies. He thought, however, that a process of simple dialysis could be excluded as the mode of formation of the fluid. Drs. Orzechowski, Boschi, and Zandt also contributed to the discussion.

FUNCTIONS OF THE FRONTAL LOBES

The discussion on the functions of the frontal lobes was opened by Prof. J. A. Barré (Strasbourg). He said that under the name of ataxie frontale Bruns had drawn attention in 1892 to certain disorders of balance in stance and gait which he had observed to be associated with tumours of the frontal lobe and which resembled cerebellar ataxia. The recognition of ataxia as a symptom of a frontal lobe tumour was of value in drawing the attention of the clinician to the need for diagnosing frontal lobe tumour from tumour of the cerebellum. Prof. Barré, however, was critical of Bruns's conception and said that "fronto-cerebellar ataxia" was neither ataxia nor frontal nor cerebellar. He considered that retro- and retro-latero-pulsion were the disorders of equilibrium most characteristic of a frontal lobe lesion, especially when they occurred early. He also discussed the apraxie de marche of Gerstmann and Schilder, which he considered to be a complex psychomotor disorder, the product partly of mental deterioration and partly of astasia-abasia.

Prof. P. Delmas-Marsalet (Bordeaux) also discussed the functions of the frontal lobe in respect of equilibrium. Experimental investigations, he said, yielded evidence that the prefrontal lobe was concerned in coördination. From the clinical standpoint it was possible to recognise four fundamental elements in the symptoms of frontal lobe lesions, a cerebellar disorder, a labyrinthine disorder, an apraxic and an agnosic factor.

Dr. K. Goldstein (New York) referred to the relations between the frontal lobes and the psychic functions. There was ample evidence that lesions of the frontal lobe, especially if they occurred on the left side, were associated with psychic disturbances, which were not necessarily limited to a single mental function. The defect which was found in all functions bore a close relationship to the particular situation which called a particular type of behaviour into play. Psychical symptoms themselves were not sufficient to determine a differential diagnosis. It was not accident that the mimic movements, language and writing, which were of such great social importance, should be represented in a part of the forebrain, near that which was concerned in psychical functions.

Dr. Clovis Vincent (Paris) described the functions of the frontal lobe from the standpoint of the neurosurgeon. He said that in certain conditions partial or total resection of the lobe gave rise to no definite psychical or motor disorders. In the neighbourhood of the third ventricle there was a mechanism whose excitation or paralysis led to a sudden swelling of the frontal lobes brought about by vascular congestion and œdema. Epilepsy, and particularly status epilepticus, might be related to this vascular disturbance in the frontal lobes. Distension of the ventricular system was capable of producing mental symptoms similar to those of a frontal lobe tumour.

Dr. R. M. Brickner (New York) reported his study of a unique patient who had undergone removal of both frontal lobes for meningioma, Broca's area and the motor cortex being left intact. An analysis of the resulting mental disorder supported the view that only one function was impaired—namely, the elaborate association or synthesis into complex structures of the simpler engrammic products associated in the more posterior parts of the brain. Dr. Brickner summed up the functions of the frontal lobes as the production of "ingenuity"; but more than ingenuity was required if man was to achieve a harmonious and intelligent control over his emotions.

THE HYPOTHALAMUS AND CENTRAL REPRESENTATION OF THE AUTONOMIC NERVOUS SYSTEM

The last discussion was opened by Prof. C. U. Ariëns Kappers (Amsterdam), who described the phylogenetic development of the autonomic hypothalamic centres in fishes, amphibia, reptiles, and birds, compared with the lower mammals. The ontogenetic development and normal conditions in man were dealt with by Prof. W. E. le Gros Clark (Oxford).

Prof. J. Lhermitte (Paris), speaking on the anatomo-clinical syndromes of the hypothalamus, said that the neural functions of the hypothalamus were indissolubly linked with the pituitary gland, the posterior or nervous lobe of which was a prolongation of the brain. The question of whether a certain syndrome was hypothalamic or infundibulo-tuberal was identical with the inquiry whether one should seek for the cause of the trouble in the vegetative centres of the hypothalamus or in a primary endocrine disturbance. He reviewed the present state of our knowledge of the anatomy and physiology of the hypothalamus and then described the syndromes which could be attributed to lesions in this region. These were diabetes insipidus; essential polyuria; essential polydipsia; polyphagia; glycosuria; sleep disorders; disorders of the sexual functions; the lipodystrophies; diencephalic obesity; hypophyseal cachexia; disorders of the hæmopoietic functions; diencephalic epilepsy; and disorders of temperature regulation. The pathological disorders responsible for these syndromes included syphilis, tuberculosis, the acute encephalitides, tumours, and hydrocephalus.

Prof. A. W. Adson, of the Mayo Clinic, described the physiological effects produced by ablation of the autonomic central influence by interrupting sympathetic pathways in the treatment of various diseases. He paid especial attention to Raynaud's disease and stated that although the cause of the pathological vasoconstriction had not been settled, observations following sympathetic ganglionectomy, trunk resection, and ramisectomy had strongly suggested a central control. The effect of sympathectomy in the treatment of congenital megacolon, disorders of the bladder, and essential hypertension were also discussed.

Prof. O. Löwenstein (Nyon) reported experimental researches on the manifestation of physical and psychophysical constitution in the vegetative nervous system. By means of cinematographic records he had been able to make a graphic representation of the behaviour of the pupils in various conditions and he exhibited graphs showing the timing of pupillary constriction and dilatation. There were several forms of normal response which he considered to be indicative of psychophysical constitution types.

Prof. Laruelle, Dr. Hirsch, Dr. Spatz, and Prof. Grunstein also took part in the discussion, which was brought to a close by Prof. B. Brouwer (Amsterdam).

Short Papers

Some 250 short papers were presented to the Congress. Epilepsy attracted the greatest interest, since apart from the discussion which occupied the whole of the first day there were over forty papers on this subject. The autonomic nervous system occupied the second place with 27 papers, and intracranial tumours and the surgery of the nervous system came next with 18. It is impossible to report more than a selection of the communications read.

EPILEPSY

Dr. W. G. Lennox (Boston) read a paper on the relationship of unconsciousness in human subjects to cerebral blood flow and to anoxæmia. A study was made of blood leaving the brain in unanæsthetised human subjects with reference to loss of consciousness. These fell into two groups. In one were those in whom the unconsciousness was preceded by a sharp fall in the volume of cerebral blood flow or was accompanied by a very low oxygen saturation of the blood leaving the brain. In the second group were those carotid sinus cases, and one hysterical, which had no preliminary fall in blood pressure. These had a decrease in neither the flow nor the oxygen saturation of the blood leaving the brain. The experiment suggested that even acute cerebral circulatory failure or anoxæmia was not the exclusive explanation of the loss of consciousness but was only a stimulus to a neural mechanism.

Dr. F. A. Gibbs and Dr. E. L. Gibbs (Cambridge, Mass.) described the convulsion threshold of various parts of the cat's brain. Experiments with a needle electrode on 400 cats had shown that not all parts of the cat's brain were equally sensitive to electrical stimulation, and there was evidence that the structure from which convulsions were most readily excited was a short fibre system running between the frontal cortex, basal ganglia, and the thalamus. The conclusion was drawn that convulsions were produced by a specialised neural mechanism in the brain, a mechanism which was at least as well localised as that which controlled dilatation of the pupils.

MM. Pagniez, Plichet, and Laplane (Paris) discussed the rôle of cutaneous parasites in the roduction of experimental epilepsy. They had found that the epilepsy of Brown-Séquard in the guinea-pig depended upon the multiplication at the epileptogenous zone of the neck or face of cutaneous parasites (mallophages), which are normally to be found in all guinea-pigs. The suppression of these parasites led to the complete disappearance of the epilepsy, which recurred on their return. A lesion of the sciatic nerve was in no way necessary for the production of the epilepsy and merely acted by favouring the multiplication of the parasites.

Dr. K. Conrad (Munich) spoke on the rôle of heredity in the ætiology of epilepsy. His study was chiefly concerned with the incidence of epilepsy among uniovular and binovular twins. Seventy per cent. of uniovular twins showed a concordance, as compared with 11·5 per cent. of binovular twins.

X RAY DIAGNOSIS

Recent advances in the radiology of the nervous system were embodied in a series of papers from Prof. E. Moniz's clinic at Lisbon. Prof. Moniz himself read one on angiography in the diagnosis of brain aneurysms and angiomas, and gave an account of the technique necessary to obtain pictures of both the arteries and the veins of the intracranial circulation.—Dr. Luiz Pacheco (Lisbon) described the displacements produced in the cerebral arteries by tumours of the frontal, parietal, and temporal lobes, and Dr. Fernando de Almeida (Lisbon) presented normal arteriograms and phlebograms of the brain.—Dr. A. Lima (Lisbon) spoke on the technique of cerebral angiography.

Dr. E. W. Twining (Manchester) reported on the radiological study of the third ventricle. The methods used had proved valuable, he said, in differentiating supratentorial from intratentorial lesions, in lesions near the chiasma and third ventricle tumours, and in study of the contours of the third ventricle and of pressure effects of the third ventricle upon the sella and chiasma.[1]

Dr. B. G. Ziedses des Plantes (Utrecht) described "planigraphy" and "subtraction," two new radiographic methods applied in neuro-roentgenology. Planigraphy yielded an isolated image of a certain plane of the object, whilst subtraction gave an isolated image of that which at one moment does, and at another moment does not, belong to the image-forming object, for example, a contrast liquid.

THE AUTONOMIC NERVOUS SYSTEM

Dr. A. van Bogaert (Antwerp) reported an experimental study of centres regulating the blood pressure in the floor of the third ventricle. He described the effect of faradic excitation in this region. It was possible to evoke a considerable rise in arterial blood pressure in the excitation of which the suprarenals played a part. At the same time the heart-rate increased at first, but later become slow. These experiments afforded evidence for the existence in the floor of the third ventricle of pressor and inhibitor centres of the cardiovascular system.

Prof. C. H. Frazier and Drs. Bernard Alpers and F. H. Levy (Philadelphia) read a paper on the hypothalamus and temperature regulation. The occurrence of hyperthermia in patients in whom suprasellar cysts had been removed at operation and who died within 48 hours showed that the areas affected are chiefly the substantia grisea of the third ventricle and small portions of the mesial part of the nucleus tubero-mammillaris.

Mr. G. C. Knight (London) speaking on the nervous control of the œsophagus, said that experiment had shown that there was a true intrinsic sphincter at the cardia, which received its sympathetic supply in part at least from the cœliac plexus. Bilateral vagal section produced the X ray appearances and symptoms of achalasia of the cardia. If, however, the sympathetic supply to the cardiac sphincter had been severed, no obstruction at the cardia was caused by vagal section. Experimental achalasia could be relieved by sympathectomy.

Prof. L. Asher (Berne) read a report on the mode of action of the sympathetic and its integrative function. An investigation of the influence of the sympathetic on muscle showed that excitation of these nerves produced restoration after fatigue. The sympathetic impulses acted on the muscle itself and shortened the time necessary for restoration. The resynthesis of phosphagen was increased on the side of the sympathetic stimulation.

DISSEMINATED SCLEROSIS

Dr. Tracy J. Putnam (Boston) read a paper on the pathogenesis of multiple sclerosis. Both multiple sclerosis and acute disseminated encephalomyelitis had been simulated in animals by the use of minute doses of tetanus toxin and more recently by obstruction of cerebral venules. Thrombi and obstructed vessels might be found in the lesions of multiple sclerosis, encephalomyelitis and diffuses clerosis. It was suggested that infectious or other exogenous factors might activate the clotting mechanism to an abnormal degree, causing thrombosis chiefly of cerebral venules and then plaques of demyelination and gliosis.

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[1] Twining, E. W., and Rowbotham, G. F.: The Lancet, July 20th, 1935, p. 122.

Dr. R. M. Brickner (New York) described the blood esterase changes associated with remission in multiple sclerosis. The serum esterase had been studied during remissions in this disease. The esterase values were not distinctive for multiple sclerosis as such, but it was found that during the active phases of the disease the values were low and during the inactive phases high.

Dr. Arthur Weil (Chicago) discussed the demonstration of endogenous myelolytic (myelin-splitting) substances in nervous diseases. A total of 460 urines was examined for the presence of myelolytic substances. These were absent in 30 normal controls, but present in 59 out of 89 patients with disseminated sclerosis and in 13 out of 16 patients with post-encephalitic parkinsonism.

ACUTE ENCEPHALOMYELITIS

Dr. E. Herman (Warsaw) discussed clinical considerations in epidemic disseminated encephalomyelitis, on a basis of 100 cases observed in Poland between 1927 and 1935. A variety of forms of the disease were described according to whether its main incidence lay upon the meninges, nerve roots, peripheral nerves, sympathetic nervous system, spinal cord, medulla, cerebral hemispheres, or psychical functions. In spite of some resemblance both to encephalitis lethargica and to disseminated sclerosis Dr. Herman regards it as a distinct nosological and epidemiological entity.

Prof. A. Austregesilo (Rio de Janeiro) spoke on acute and subacute epidemic neuromyelitis observed in Brazil. Five principal varieties, he said, had been observed: a form with a polyneuritic onset followed by remission and later aggravation; a form characterised by acute neuromyelitis, with fever and symptoms of meningoencephalitis; a severe and fatal form of Landry's paralysis; a severe but completely recoverable form of Landry's paralysis; and a form of acute neuromyelitis of the Landry type but terminating in myelitis. It was believed that a new virus was responsible for the malady.

THE SURGICAL TREATMENT OF HYPERTENSION

Prof. Max M. Peet (Ann Arbor, Michigan) reported the results of operations upon 60 patients with hypertension. The surgical procedure consisted of bilateral resection of the greater and lesser splanchnic nerves and of the lower dorsal sympathetic chain, usually including the 10th, 11th, and 12th dorsal ganglia. The blood pressure of all patients operated upon was over 200 mm. of mercury, and many showed retinal hæmorrhages and exudation with papillœdema. Some degree of improvement was seen in 85 per cent., and in 15 per cent. this amounted to apparent cure; 10 per cent. were not benefited. In some cases the blood pressure, previously as high as 285 mm. of mercury, remained at 130 or 140 over periods ranging from six to seventeen months. Papillœdema, retinal hæmorrhages and exudate disappeared and there was a complete return to normal vision and renal function.

Prof. Adson (Mayo Clinic) described the results obtained in 32 cases. He had found that bilateral ventral rhizotomy through a laminectomy wound from the 6th thoracic to the 2nd lumbar roots inclusive was more effective than bilateral resection of the splanchnic nerves. The mean drop in systolic pressure after extensive rhizotomy was 44 mm. of mercury and the mean drop in diastolic pressure was 38 mm. The patients who responded best to this treatment were those whose symptoms of hypertension were progressive but whose disease had not done irreparable damage to the heart, kidneys, or retinal and cerebral vessels.

Prof. Pavlov's Address

Prof. I. P. Pavlov, speaking in German, read before a crowded audience a paper on "the types of higher nervous activity, their relation with the neuroses and psychoses, and the physiological mechanism of neurotic and psychotic symptoms." On the basis of his experiments on conditioned reflexes, Prof. Pavlov said it was possible to distinguish four types of dog. According to the strength of the excitation processes the dogs could be divided into two groups, the weak and the strong. The strong could be further subdivided according to the relationship between their excitation and inhibition processes into the balanced and the unbalanced, and finally the strong balanced type could be divided according to the liveliness and lability of the nerve processes into the slow and the quick. Thus the four types were, the strong unbridled, the strong balanced and slow, the strong balanced and quick, and the weak. These corresponded to the four Greek temperaments, the choleric, the phlegmatic, the sanguine, and the melancholic. In order to explain the normal and the pathological conduct of man it was necessary to add to these types which were common to man and animal, special human types, the artistic, the thinking, and an intermediate type. Under experimental conditions neuroses arose readily in the excitable, unbridled, and in the weak type of dog. The former lost almost entirely the capacity for inhibition: in the latter the higher nervous activity either failed entirely or remained in a chaotic state. Kretschmer, who limited himself to two general types, the unbridled and the weak, appeared to relate the former type with manic-depressive psychosis and the latter with schizophrenia.

Prof. Pavlov considered that constitutional neurasthenia was the characteristic disorder of the general weak or unbridled type and of the intermediate human type. Hysteria is the product of the general weak combined with the artistic type, and Janet's psychasthenia the product of the combination of the general weak with the thinking type. Weakness of the excitation processes led to predominance of the inhibition processes in the form of sleep and hypnotic conditions, and a similar explanation was offered for narcolepsy, cataplexy, catalepsy, and catatonia.

Hughlings Jackson Lecture

The Hughlings Jackson lecture, entitled The Motor Cortex in Man in the Light of Hughlings Jackson's Doctrines, was delivered by Prof. Otfrid Foerster, of Breslau, at a special meeting of the neurological section of the Royal Society of Medicine before an audience drawn from neurologists of all nations assembled in London for the Second International Congress of Neurology.

Dr. S. A. Kinnier Wilson, president of the section, after recalling the distinguished neurologists who had previously delivered the Hughlings Jackson lecture, explained that the lecture had been arranged to coincide with the meeting of the Congress as a fitting celebration of the centenary of Hughlings Jackson's birth.

Prof. **FOERSTER** expressed his appreciation of the honour conferred upon him in being asked to deliver the lecture in the year of Hughlings Jackson's centenary, and of the opportunity it afforded him of paying a tribute to Hughlings Jackson in the place where he had carried out the work which constituted "monumentum aere perennius."

Jackson was the first to point out the existence of a motor cortex, his recognition of which was based upon the experiments on the human brain conducted by disease. He recognised that epileptic convulsions were a caricature of movements and from this he derived the revolutionary view that the cortical motor cells must be concerned with movement. Jackson's localisation of foci in the motor cortex, based upon clinical observation, alone remained unchanged to-day. Prof. Foerster discussed the significance of the bilateral representation of certain movements in the motor cortex and said that in the case of these movements bilateral effects could still be obtained from electrical excitation of the motor cortex after division of the corpus callosum. Movements were not represented in the motor cortex in sharply delimited areas. Repeated electrical stimulation of a single area might be followed by movements of different though closely associated limb segments. The motor cortex, in fact, was not a mosaic like a cubist picture but more closely resembled the soft and merging colours of a Raphael Madonna.

As a result of the localisation of motor functions in the motor cortex localised lesions in this region produced focal palsies, examples of which were given. The precentral convolution had been subdivided by Brodmann into two areas, area 4 and area 6 aα on the basis of differences in the size of the ganglion cells. An English neurologist had recently expressed the opinion that this anatomical difference was not correlated with any difference of function, a view which would not have been acceptable to Hughlings Jackson and was in conflict with the fundamental work of the Vogts and Fulton. Electrical stimulation confirmed the difference of function between these two areas and there was evidence that the motor effects of area 6 aα were mediated through area 4, for after excision of area 4 area 6 aα was no longer excitable.

In Jackson's view no cortical area was purely motor and none was purely sensory. Though the postcentral convolution was an important sensory area, when stimulated electrically it yielded the same movements as the precentral convolution, though the threshold was higher. The aura of a convulsion originating in the postcentral convolution was a sensory disturbance.

Prof. Foerster described the features of the convulsions excited by stimulation of other regions of the cerebral cortex. Severe vertigo occurred as a manifestation of an irritative lesion of the interparietal sulcus. From motor areas other than the precentral convolution complex postures and movements could be excited. Such excitable areas utilised extrapyramidal paths and were the means by which were mediated the clumsy synergic movements of the whole limb which remained after destruction of the pyramidal tract. After such a lesion improvement in skilled movements might occur through the compensating function of the undamaged ipsilateral motor cortex, but such compensation was never complete. After excision of an area of extrapyramidal motor cortex, motor symptoms were absent or transitory. The isolated destruction of area 4 or of area 6 aα, the results of which had been so carefully analysed by Fulton in the primates, was very rare in man.

There was scarcely a single neurological problem which had not been illuminated by Hughlings Jackson's ingenuity. It had been said that, except the blind forces of nature, nothing moved in this world which was not Greek in origin, and it was true to say that nothing moved in neurology which was not in origin Jacksonian.

After Dr. **KINNIER WILSON** had presented Prof. Foerster with the Hughlings Jackson medal, Prof. **VIGGO CHRISTIANSEN**, Prof. **G. MARINESCO** (*in absentia*), Prof. **MAX NONNE**, and Prof. **PAVLOV** were admitted as honorary members of the neurological section of the Royal Society of Medicine.

Social Functions

His Majesty's Government gave a reception to members of the Congress at Lancaster House on Monday, July 29th, when the members were received by Sir Kingsley Wood, Minister of Health, and Lady Wood. On Tuesday receptions were held at the Royal Colleges of Physicians and Surgeons, where members were received by the presidents, Lord Dawson of Penn and Sir Cuthbert Wallace. On Thursday the official banquet of the Congress was held at the Grosvenor Hotel. Dr. Gordon Holmes presided and the toast of the International Congress was proposed by Lord Dawson and responded to by Prof. Kroll on behalf of Prof. Pavlov, Dr. Bernard Sachs, Prof. Claude, Prof. Nonne, and Prof. Christiansen. The toast of the officials was proposed by Prof. Monrad-Krohn and responded to by Dr. Kinnier Wilson. On Friday a reception was held at the Royal Society of Medicine, the guests being received by the immediate past-president, Mr. Warren Low. A cinema entertainment was given. The beautiful weather added much to the pleasure of the meeting and especially the excursions to Oxford, Cambridge, and other places of interest in and around London.

The arrangements for the Congress were in the hands of Dr. Gordon Holmes, president; Dr. S. A. Kinnier Wilson, secretary-general; Dr. Anthony Feiling, treasurer; and Dr. Macdonald Critchley and Dr. E. A. Carmichael, assistant secretaries. Mrs. Wilfred Harris was chairman of the ladies' committee, of which Mrs. Gordon Holmes and Mrs. Kinnier Wilson were secretaries.

PARIS

(FROM OUR OWN CORRESPONDENT)

TYPHOID FEVER AND SHELL-FISH

WITH the notification of typhoid fever little more than a pious ideal, it is notoriously difficult to obtain reliable figures about the morbidity from this disease in France. Mortality returns are nearer the truth, witness the paradox that in certain areas the death-rate exceeds the sickness-rate from the enteric fevers. Since 1925 the *Bulletin de la Statistique Générale de la France* has been publishing mortality returns of which Dr. G. Dubreuil has recently made good use. His main points are that the enteric fevers are more common in seaboard than in inland areas, that the *fruits de la mer*—i.e., shell-fish and the like—are out and away their most serious cause, and that the comparatively small communities living on the sale of these fruits are at present disregarding public health measures at the expense of vast numbers of consumers These pay with their lives for the immunity enjoyed by a minority to poison them. As Dr. Dubreuil caustically remarks: "It seems to me that those who speak in favour of the living producers might be confronted with the representatives of the dead consumers. For though the latter no longer vote, they have at least a consultative voice." Dr. Dubreuil's figures deal with the seven-year period 1925–1931, and show that the average annual death-rate from typhoid and paratyphoid fever throughout France was 4·8 per 100,000 inhabitants; the department of Bouches-du-Rhône heads the list with 16·2 deaths per 100,000. Of the 23 departments with a typhoid mortality above the average, only 7 were inland departments; whereas of the 67 departments enjoying a typhoid mortality below the average, only 9 were seaboard departments. Of the 66 inland departments, as many as 57 had a typhoid mortality below the average. In his study of the four principal zones of endemic typhoid fever, Dr. Dubreuil gives due credit to defective drainage and water-supplies, milk and its products, and raw fruits and vegetables as causes of the enteric diseases; but he comes back to the *fruits de la mer* as the crux of the problem.

PIRQUET TESTING OF RECRUITS

There is this to be said against Pirquet surveys of students, hospital patients, and other more or less isolated units, that the findings are applicable only to a limited class. A conscript army, on the other hand, with its deliberate disregard of social and economic strata of society, offers opportunities for investigations whose conclusions hold good for the entire population at a certain age. A recent Pirquet survey has been presented by Dr. J. Troisier, Dr. M. Bariéty, and Dr. P. Nico to the Academy of Medicine (Bull., 1935, cxiv., 54); their material consisted of infantry recruits, aged 20 and 21, combed out from all the social classes of northern and eastern France. Some came from the country, others from large towns. In as great a proportion as 25 per cent. the reaction was definitely negative, and only in 60·6 per cent. was the reaction definitely positive. These findings, confirmed in many other countries, suggest that the teaching of yesterday, that nearly every member of a civilised community is Pirquet-positive before adult life is reached, is incorrect or out of date. If it is incorrect, then we have been misled into applying to the world at large the findings of tuberculin surveys in hospital and urban milieux in such towns as Vienna. If, however, this teaching is out of date, and what was true a score of years ago is no longer true to-day, then we seem to be approaching a time when, with many if not most of our young adults tuberculin-negative, we must think of them in terms of susceptible natives hailing from distant shores whose soil is virgin. As the military investigations just quoted show, the percentage of negative reactors is much higher among young rural than young urban members of the community; and now that the pendulum is swinging in favour of regarding the young tuberculin-positive adult as more tuberculosis-resistant than the young tuberculin-negative adult, the centre of gravity of the problem is shifting from the town to the country. If something has to be done for the rural aspirant to army or city life, the thoughts of Frenchmen to-day naturally turn to B C G inoculation of the tuberculin-negative.

THE EXAMPLE OF BREST

And recent experience at a naval port points in the same direction. The port of Brest is one of the black spots on the tuberculosis map of France. Officially, and during the past ten years, the annual death-rate there from tuberculosis has been 5·3 per 1000. More than every fourth death is officially traced to tuberculosis. But with the official notification of tuberculosis as a cause of death notoriously incomplete, these figures are an under-estimate. More instructive is the observation that, for the whole of France, the tuberculosis death-rate is about 1·6 per 1000 annually, or less than one-third that of Brest. Faced by this serious state of affairs, Dr. J. Quérangal des Essart, chief medical officer of the 2nd Arrondissement Maritime of Brest, has, since 1926, sought to reduce the morbidity and mortality from tuberculosis by systematic B C G vaccination of infants and tuberculin-negative children and young adults, and in coöperation with Mme G. de Carbonnières de Saint-Brice he has now published (Rev. de la Tuberc., June, 1935) studies of 823 families with a total of 2277 children, 1193 of whom were given B C G by the mouth at birth in three doses, while the others served as controls. Other children were given B C G by subcutaneous injection. The presentation of their results leaves much to be desired, but it seems pretty clear that the mortality among the controls was much higher than among the children who had B C G.

DEATH OF A CENTENARIAN

The death on July 16th of Prof. Alexandre Guéniot has shocked Paris into realising that even centenarians are mortal. Ever since November, 1932, when he celebrated his 100th birthday, his alert and cheerful personality had captured the imagination of his compatriots who had come to regard him as the personification of the most vital qualities of the typical Frenchman. A much interviewed man, he was generous in parting with the secrets of his long life. They were simple enough in all conscience. No asceticism but moderation, moderation in all things. Caution also was one of his watchwords. Before you cross a road, look to right and left and then to left and right. He applied this advice to his own conduct both metaphorically and literally. His career was distinguished. In 1863 he was appointed to an obstetrical hospital in Paris, and in 1869 the title of professor was conferred on him. He was president of several important societies including the Obstetrical Association and the Academy of Medicine. Most of his publications from 1860 onwards dealt with gynæcological subjects.

TOLL OF THE ROADS

Dr. Béhague has described the organisation of first aid on the French highways—a system for whose creation he is largely responsible; there are now more than 2000 first-aid posts on the highways, and they treat an imposing number of casualties. There are, according to Dr. Béhague, three particularly dangerous hours. Between 11 and 12 road accidents are common because the meal ahead makes the driver accelerate. Between 3 and 4 he is again liable to accidents because the meal to which he has hurried has rendered him drowsy and, if alcoholic, it has also impaired his judgment. There is a third accident peak at 6, when workers leave the factory and scurry off on bicycles on which they collide with motor-cars. But the motor-bicycle is the supreme generator of road tragedies. Absolutely the number of road accidents continues to show an upward curve, but relative to the number of vehicles there has been a progressive decline since 1932, the happy result of a combination of factors—better roads, better cars, better signals, and better drivers, for 35–40 per cent. of those who would like to drive are eliminated by failure to satisfy the examiners for licences. Dr. Béhague lays great stress on the educational measures designed to create a healthy fear of motor vehicles in the minds of the younger generation; he notes that dogs and chickens are less vulnerable than they used to be, having educated themselves. But how he does not explain.

BUCHAREST

(FROM OUR OWN CORRESPONDENT)

AN ACADEMY OF MEDICAL SCIENCES

A LONG-FELT want is met by the establishment of the new Rumanian Academy of Medical Sciences, whose object is the furtherance of medical, veterinary, and pharmaceutical knowledge. For the time being it will have only 32 members, nominated by the medical, veterinary, and pharmaceutical faculties of the universities. The Bucharest medical faculty is represented by Profs. Anghelescu, Balacescu, Danielopolu, Marinescu, Parhon, Proca, and Rainer. At the first meeting, held on July 1st, the members elected Prof. Anghelescu, the present minister of education, as their president, and Marinescu their vice-president. Meetings will be held twice monthly in Bucharest, and from the beginning of next year the Academy will publish a periodical of its own with the title *Buletinul Academiei.* At the meeting on July 15th six honorary members were appointed on the recommendation of a committee, which was asked to submit the names of six illustrious foreign professors who have some connexion with the advance of Rumanian medical sciences. They are Profs. Charles Achard, Henri Vaquez, Emile Sergent, Henri Hartmann, Jean-Louis Faure, and Gustave Roussy. The Academy is to be formally opened, in the presence of many foreign medical celebrities, on Nov. 1st.

PROF. MARINESCU RETIRES

The doyen of Rumanian neurology, the greatest living Rumanian medical scientist, Prof. Marinescu, is to retire on reaching the age limit. His successor will be Dr. Paulian, director of the Central Neurological and Psychiatric Hospital. Paulian is a pioneer of modern neurology and has just returned from lecturing in France, where he has been received with sympathy and approbation. He will be a great gain to the medical faculty, for he is an indefatigable worker in what bears on the social aspect of medicine.

RACIAL PRIVILEGES

In the past academic year there have been frequent disturbances, very often with anti-Semitic tendency, especially in the medical faculty of Bucharest University. So serious did things become that the university board had to fall back on closing the gates of the faculty a month before the Easter holidays. Seeing that this measure did not put an end to the excesses, the board called a conference with the object of making drastic decrees for the restoration of order. This conference strongly condemned the attitude of the students and resolved to deal with them firmly in the future. At the same time it acknowledged, in principle, that limitation of the number of medical students would not be out of place. Selection is necessary, though not on religious or racial grounds, and a committee has been appointed to arrange for examinations to be passed before matriculation. Meanwhile there is a widespread movement, started by M. Vaida-Voevod, the late *Prime Minister*, which demands the protection of the racially Rumanian elements by securing them an 80 per cent. representation in industry, in trade, and also in the so-called free occupations, such as medicine and the law. Thanks to the sane outlook of the present government, Vaida has failed to gain enough adherents to bring his policy into effect, but it has nevertheless stirred up feeling, and even local medical societies have urged that 80 per cent. of State and official positions shall be held by ethnical Rumanians. In these circumstances Prof. Ghiulea of Cluj University, a renowned sociologist, has pointed out that according to the laws at present in force it is not permissible for the universities as a whole to limit enrolment: only the single faculties have the right to fix the number of students. On the other hand, he says, nobody has a right to forbid a citizen from taking his share of education, and from this point of view the suggested limitation is directed against the universal human culture—a proposal the less understandable, because no serious ground for the limitation or reduction of the number of students can be found. At the University of Cluj the number of the Rumanian elements dwindles from year to year, in comparison with the minorities. This phenomenon is not attributable to the increase of the number of minority students but to the pauperisation of the Rumanian elements. The government, in Prof. Ghiulea's opinion, has not solved the problem by excluding the minorities from the high-school education under the "numerus clausus" (as it is called here), which means that the minorities can enrol to the high schools only in the proportion of their census numbers to the general population. The minorities go away to foreign universities and return with first-class qualifications. The "numerus clausus" cannot be a serious solution; results can be attained in this sphere only by complete liberation of education, coupled with support for the Rumanian elements. We have no right to close the gates of the universities to the minorities, concluded Prof. Ghiulea, and thereby exclude them from the boons of culture. The country needs enlightened men and not half-cultivated or uncultivated ones.

COMPULSORY MEDICAL WORK IN THE COUNTRY

Hitherto the supply of doctors to the Bulgarian rural population has been very insufficient. Three-quarters of the physicians live in towns and cities, while three-quarters of the population live in villages. Outside the towns life is so primitive that a man with university education, be he ever so little pretentious, can only put up with it at great self-sacrifice. The Bulgarian government is trying to remedy the present state of affairs—in which there is only one doctor for every 8000 people in the country—by a modification of the public health laws. The new law, which has been recently sanctioned, prescribes two years' compulsory medical service in villages. Any duly qualified physician, who after his graduation has spent a year either at a clinic or in a State hospital, is entitled to carry on practice in a village, and none is allowed to settle in a town unless he can produce a certificate of having spent two years in a village. The board of public health has compiled a list of all the better-class villages where rural practice can be carried on. The villages in their turn are obliged to supply the doctors with adequate houses, while the State pays them 2000 levas monthly. Where the doctor will be called to outside areas he has to be provided with a suitable car. The physicians are obliged to treat poor patients free, but only in their surgeries. The outside fees fixed by the government are quite acceptable: thus a visit to the patient's house is reckoned at 4 shillings, and an intravenous injection at 2 shillings.

MEDICINE AND THE LAW

Damages for Shortened Life

If a man is injured by somebody's negligence and dies of the injury, certain claims for damages which formerly died with him will nowadays survive for the benefit of his estate. This is due to the Law Reform (Miscellaneous Provisions) Act, passed last year. If the injured man lived, he would be able to recover damages for the pain and suffering inflicted by the accident and for the diminution of his normal expectation of life. Under the new law these two claims survive after his death, but an important decision last week (in Slater *v.* Spreag) shows how the new law may be restricted. Mr. Slater was a chimney sweep and gardener, earning £5 a week on the average. Cycling on the Great North Road, he was struck by the defendant's motor-car; his skull was fractured and he died two days later. At the trial the defendant admitted negligence and the case was fought on the issue of damages. Even under the former law Mr. Slater's widow (who was also his administratrix) could have recovered certain limited sums. Under the new law she asked for additional damages for the pain and suffering caused to her husband by the accident and for the diminished expectation of his life. He was 44 years old and in excellent health previously. But he had been unconscious from the moment of his accident until he died. It could not be proved that he had suffered pain; so here was an element of damages which did not exist for him and could not survive for the benefit of his estate and his widow. For the same reason his shortened expectation of life gave his estate nothing to sue upon. In Mr. Justice MacKinnon's view the new law here takes into account only the subjective effect on the injured man, the mental effect upon him of his knowing that his life was cut short. If Mr. Slater never regained consciousness, he never knew of his diminished expectation. There never existed for him on this ground any mental distress which at his death could be cashed for the benefit of his estate. In an easily imaginable case, where an injured man lives on for six months in pain and sees his death approaching him untimely, his right of damages in these respects can survive his death; in Mr. Slater's case there was no claim which could survive. The widow, however, obtained damages on other grounds available under the old law.

Thus the new Act is being gradually elucidated. It has been argued with force that damages are compensation to be paid to a man for injuries suffered by him and that it is impossible to assess the damages to be awarded to one man for injuries sustained by another. How, it is asked, can a man's estate reasonably be compensated if he suffers pain before death? If, to quote the familiar argument usually advanced in these cases, a man bequeaths his estate to the British Museum, how can the institution be compensated for the sufferings which caused his death? The more his life is shortened, the better for the institution. What passes to the executors is not an accrued claim for damages, but merely a right of action; damages cannot be assessed after a man's death on the assumption that he is still alive. Be these metaphysical speculations as they may, Parliament passed the new law and the judges have to make the best of it they can. This was the first time the point has been taken in the London courts. In one case at assizes, Mr. Justice Humphreys has awarded an executor damages for the pain and suffering of the deceased; in another case at assizes Mr. Justice Macnaghten refused to do so. Earlier this year (in Flint *v.* Lovell) the Court of Appeal held that damages at common law, awarded to a man still living, might include a sum for the shortened expectation of life caused by the defendant's negligence. But critics insist that the doctrine of damages for shortened expectation of life cannot reasonably be applied to cases where life has already been shortened by death.

Hearsay Evidence at Inquest

At an inquest last week counsel, appearing for one of the parties possibly concerned, made a protest against the admission of hearsay evidence and even (according to newspaper reports of the case) threatened the coroner with a prerogative writ of some kind for the latitude with which the witnesses were treated. Barristers, accustomed to the strict rules of evidence observed in the regular courts of civil and criminal jurisdiction, naturally and properly take points in the interests of their clients at coroner's inquests; but it is hardly necessary now to say that a coroner is fettered by no rigid rules of evidence. He is bound, as Mr. Justice Wills explained in 1890 when charging the grand jury in a murder case at Chester assizes, to collect as far as he can all information and knowledge of disasters from neighbours and others who can throw any light upon the cause of death; he can often collect facts and statements, which, whether or not they can ultimately be turned into evidence against persons to be put upon their trial, are valuable "as supplying material for investigation by the police and as affording clues which may lead to successful inquiry." If, said Mr. Justice Wills, the coroner rejected evidence on the supposition that he was in the same position as a judge trying a prisoner, he would throw away a good deal of the remaining usefulness of the institution of the inquest. The committee which is at present considering the possible revision of the law and practice of coroners is hardly likely to overlook this aspect.

Two further considerations are not to be forgotten. First, strict rules of evidence largely depend on relevance. A definite person is accused of a definite offence on a definite date; thereupon the witnesses are directed to the proper end as it were along tramlines. At an inquest all is vague; it may be uncertain whether any offence has been committed and whether any specific person was concerned; hence, instead of moving along direct lines to a well-defined object, inquiry roves tentatively in all directions. It is the function of the coroner to range widely, though, where any person is incriminated before him on evidence which is strictly irregular, he will usually advise the jury to dismiss from their minds the inadmissible testimony before committing anyone for trial. In the second place the barrister, who seeks to impose on all tribunals the highly technical rules of procedure in which he has been trained, has no right to take part in an inquest or to put questions or make speeches save by permission of the coroner. Here again there is no analogy between a coroner's court and an ordinary criminal trial, though here again the coroner exercises a discretion which usually satisfies the Bar.

THE THIRD EUROPEAN REUNION OF MENTAL HYGIENE

This congress took place at Brussels on July 20th and 21st, under the auspices of the Belgian National Council for Mental Hygiene. The president was Dr. Ernest de Craene, and the general secretary Prof. G. Vermeylen, both of the University of Brussels. The meetings were well attended and included representatives from Australia, Canada, U.S.A., France, Finland, Holland, Italy, Switzerland, Esthonia, Belgium and Great Britain. The British Government were represented by Sir Laurence Brock, C.B.E., chairman, and Sir Hubert Bond, senior commissioner of the Board of Control. The National Council for Mental Hygiene for Great Britain was represented by Dr. H. Crichton-Miller, Dr. J. R. Rees, and Dr. Doris Odlum. Other British members present were Dr. E. A. Bennett (London), Dr. Mary Luff (London), and Dr. Hemingway Rees (London).

BOARDING-OUT OF MENTAL PATIENTS

In opening the discussion on the first subject, the boarding-out of mental patients in families other than their own, Prof. G. Corberi (Milan) said that this method had only been used in Italy since 1900. The chief reason for its trial had been the necessity of relieving the mental hospitals which were aiming at separating the treatment of those patients suffering from acute and chronic forms of mental illness. In Italy, the foster-families were mostly peasants living in the neighbourhood of a hospital. Since the war there had been a gradual reduction in the numbers boarded out, which was attributable to the recognition of the value of occupation therapy carried out under direct medical control. At Imola, a new system had developed on the ruins of the old. It consisted of the formation of little colonies of patients in the care of peasant families, both colonies and families working under the control of an organisation which dealt with all the needs of the patients, and was responsible for paying the foster-families. At the present time about 10 per cent. of the mental patients from the provincial hospital of Imola were cared for in this way, the cost being halved. He was convinced that this method of treatment was capable of considerable extension.

Dr. Sano (Gheel) said that Gheel was in the peculiar position of having centuries of tradition in the boarding-out and treatment of mental patients. There was a small central hospital to which patients could be sent if they proved unsuitable for family care, and should this condition persist, they would be transferred to one of the State mental hospitals. The difficulty of finding suitable and willing foster-families was one of the greatest drawbacks in places which had not the traditions of Gheel.

Dr. J. Vié (France) spoke of the conditions at the colony of Ainay-le-Château, and discussed the type of mental illness most suitable for care in a colony of the type of Gheel. The medical indications for such treatment depended very largely upon the type of family that would receive patients. Its true function, he said, was a form of social psychotherapy—a readaptation to the life of a household, without emotional stresses, and of a simple character associated with the curative effects of occupation. He thought that, as at Gheel, patients of varying social classes should be part of the system.

In the course of discussion, Sir Laurence Brock said that the experiment of boarding-out the more chronic case, in order to relieve the pressure on the mental hospital, and also to afford the patients themselves some measure of normal home life, was now being attempted in England and Wales. Up to the present, the difficulties had been, primarily, in finding suitable homes. Very few people were willing to take such patients, except those living in rural areas, notably in Suffolk and Wiltshire, and in very poor circumstances. In addition to the difficulty of finding suitable homes, there was the question of keeping the male patients out of public houses. He himself was convinced of the value of this system to the patients, but it was not likely to provide any appreciable saving in the expense of maintenance. If the system were extended to the recoverable case, it might well accelerate their restoration to health in suitable cases.

Prof. Corberi, in summing up, pointed out that at Gheel acute cases were frequently boarded-out, often without any preliminary hospital treatment. He favoured the procedure of treating the acute case in hospitals and only the chronic case placed in a family.

PUNISHMENTS AND RESTRICTIONS

With Sir Hubert Bond in the chair, Dr. H. Meng (Basle) opened the discussion on the psychological value and dangers of punishment and restrictions in the upbringing of the child. He spoke from the psychoanalytic angle, basing the use of punishment and restrictions on a fundamental desire for the control of others which exists in every human being. He held that all punishments and restrictions should aim at bringing the aggressive tendencies of the child under the control of a strong ego. Perhaps one of the most valuable contributions of psycho-analysis to public health lay in its revelation of the true emotional interactions between parents and children. All educational methods should be examined from the point of view of their present and future effectiveness in controlling the aggressive and sexual instincts of the child, so that he might become a productive and coöperative member of the community.

Dr. H. Crichton-Miller stressed the importance of the family and the school as the essential agents of social adaptation. Personal discipline and active social coöperation were the final aim of all educational systems. Dr. Crichton-Miller agreed that the adult desire for vengeance as a basis of the infliction of punishment and restrictions was worthy of investigation, but he did not feel that it was the fundamental problem. Punishment, in his view, had been employed in every stage of society in order to control the child's tendencies to aggression and disobedience, and to combat his destructive instincts. The basic duty of the adult was to adapt the child to life with a minimum of suffering, on a basis of establishing emotional conditioned reflexes. The stress on the vengeance aspect of punishment he regarded as a characteristic error of the Freudian school of thought. In the process of adaptation to life, it was desirable that the child should be surrounded by controlling forces, which in their impersonality and inexorability should appear to him to approach as closely as possible to the laws of nature. The adult who used his desire for power tended to be arbitrary and autocratic, and therefore to destroy the child's sense of emotional security. It was essential that the child should be able to foresee what the emotional attitude of parents or teachers would be to its behaviour, otherwise it would develop a sense of anxiety, discouragement and insecurity. Even the bitter resentment that an over strict régime would provoke, was less damaging than such a feeling of insecurity. Many people condemned all punishments, saying that they believed in controlling by love. The great danger of this attitude was the development of a personal attachment, which was hostile to real freedom. The ideal formula for the child should be "I shall do this in order that I may become a man and independent; if I do not do this, I shall suffer from the opposition of society." The too-strict father replaced it by this formula: "I shall do this to avoid punishment," and the mother, who traded on the child's affection for her, substituted the formula: "I shall do this, or mother will not love me." Of these, the last was obviously the most dangerous; in both cases the child would not develop his personality, but would be influenced rather by the desire to escape discomfort. Though punishments and restrictions had a certain value in the early stages of education they could not in themselves produce a positive attitude of mind, which should be the aim of all education.

In the course of discussion, Sir LAURENCE BROCK spoke as the father of a family, who believed that the ordinary normal child was all the better for a certain amount of punishment and restriction, provided that these were justly administered.—Dr. ODLUM agreed with Dr. Crichton-Miller that nothing was worse for a child than to feel emotionally insecure. Children were, so to speak, emotional barometers where the adults around them were concerned.—Dr. O. L. FOREL (Geneva) agreed that a discipline founded on the desire to render the child an independent personality was the ideal of all education. The actual method was of less importance than the spirit which actuated it.

MENTAL HYGIENE AND THE PRESS

Dr. FOREL spoke of the importance of the Press in influencing the psychology of the people. He was particularly opposed to the publication of reports of suicides, and to advertisements of certain types of drug. Law reports of unsavoury cases and obscene pictures were calculated to undermine public morality. He considered that it would be valuable if each paper could have attached to it a critic competent to assess the mental hygiene value of news.—Dr. J. VAN DER SPEK (Holland) emphasised the suggestibility of the public. Even the more highly educated were greatly influenced by the attitude of their favourite publication. The Press was one of the greatest forces in the world for good or evil.

At the conclusion of the congress the Belgian Council for Mental Hygiene were thanked for their kindness and hospitality. On behalf of the National Council of Mental Hygiene of Great Britain, Sir Laurence Brock and Dr. Odlum invited the members to hold the fourth European reunion in London, in July, 1937.

PUBLIC HEALTH

Food

THE war taught the peoples of Europe that the organisation of national food-supplies was possible. The depression has sharpened their interest in nutrition. Remembering the anxieties of war-time they have expected manifestations of under-nourishment among the families of the unemployed, or the partially employed, and have planned to prevent underfeeding especially of the children. As the result of mass experiments and surveys more is known about the state of nutrition of communities all over the world than ever before, and the effect of supplementation of diets or deprivation of certain food constituents has been widely studied. The remarkable fact has been established beyond question that, in a period of almost unprecedented world depression, the physique of the children of the poor is improving. It is difficult to attribute the phenomenon to anything but intelligent application of the rapidly increasing knowledge scientifically acquired as to foods and feeding, together with a humane attitude toward questions of financial assistance of the poor. Interest in the subject, in spite of the demonstrable improvement, shows no sign of abatement. Indeed, from the feeling that little new remains to be done about the prevention of communicable disease in temperate lands—unless methods of immunisation are simplified and perfected and welcomed by the public—health departments are becoming more physiological and less pathological in their outlook. It seems clear that the promotion of physical and mental fitness, which was the object of the establishment of school medical and maternity and child welfare services some thirty years ago, must absorb the attention of medical officers in public health departments to an increasing extent, and nutrition is at the root of these problems.

A WORLD SURVEY

Recently we drew attention to a summary of present-day knowledge on foods and nutrition prepared in the Health Department of Glasgow.[1] There now comes to hand a broader survey of the subject, prepared by Et. Burnet and W. R. Aykroyd at the instance of the Health Organisation of the League of Nations,[2] addressed to public health authorities. The writers modestly refer to the superficialities of their survey, but from a practical point of view it is exhaustive. It occupies 150 pages of the bulletin and deals with the place of nutrition in public health programmes, the relation of national economics to physiology, the evolution of diets and dietary habits among different races, our present knowledge of nutrition, dietary and nutritional standards, problems of production and distribution of food, and educational principles and methods in relation to nutrition. References to 129 original articles are given. Of special interest is the emphasis laid on the international problem exhibited by insufficient or defective feeding in some countries while others are suppressing production or actually destroying food; and the preoccupation of governments with economic issues regardless of their public health repercussion. Economic nationalism and public health internationalism are, in the writers' view, incompatible. Special attention is also devoted to the diets of rural communities.

THE FARMER'S DIET

A recent inquiry[3] in Wales by Mr. J. P. Howell, M.Sc., into the economics of farming and its effect on the dietary of farmers' families deserves notice. From this limited investigation it would appear, as might be expected, that such families have a definite advantage over the average of the community both in the quantity and quality of foods consumed, this being especially noticeable as regards milk, butter, and potatoes, although they may lack the variety which they would choose if the opportunity were afforded. These observations are obviously not applicable to the case of the farm labourer, whose family dietaries are apt to be lacking in first-class protein and whose children, walking considerable distances to school, often suffer from the lack of a proper midday meal.

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[1] THE LANCET, 1935, i., 1469.
[2] Quarterly Bulletin, June, 1935.
[3] Welsh Journal of Agriculture, 1935, xi., 48

CONSUMPTION OF MILK

Burnet and Aykroyd devote a good deal of attention to the special value of milk as an article of diet and the efforts which have been made to promote its consumption. Figures are frequently quoted as to the relative quantities consumed in different countries, but comparatively little is known about the use of milk in different social classes and the form in which it is purchased. Two recent inquiries made in Cardiff [4] and the distressed areas of South Wales [5] by the Department of Agricultural Economics of Aberystwyth University College are therefore of interest. In the former four samples each of about 100 families were investigated, grouped roughly as good middle class, good working class, new housing area and poor working class. Figures are given showing the decline of consumption of liquid milk from 0·55 pint per head per day to 0·16 with descent in the social scale, and the reverse process as regards tinned milk (mostly skim). Among the poorer families those with children purchased less milk on the average than those consisting entirely of adults, and many children received nothing but skimmed condensed milk. In the Rhondda valley there is less distinction of class and less variation in milk consumption. The daily consumption of liquid milk (including public supplies) over 602 families averages 0·236 pint per person, raised to 0·327 pint when forms of "milk-stuff" such as tinned and dried milk (but not cream) are included. As another recent investigation showed,[6] more liberal public assistance and supply of free milk in the Rhondda than in Cardiff seems to be associated with a better state of nutrition in the poor children of the former area.

SCHOOL MEALS

The administration of supplementary feeding of school-children continues to be a subject of controversy. The points at issue are connected with the practice of the Unemployment Assistance Board of making deductions from family allowances in certain instances in consideration of free meals granted to children by education authorities; and the medical selection of children for free meals which the Board of Education demands. As to the former no public health question seems to arise if the scales of assistance can be regarded in themselves as adequate to maintain the physical fitness of a family and the deductions are equitable. On the second point the essential criticism is that the detection of incipient malnutrition is beyond the skill of the medical practitioner within the time available for the purpose and that, in its logical application, every child who appears to have reached normality ought to be deleted from the list of grantees until he presents fresh evidence of deprivation. Operation on these lines of Section 84 of the Act of 1921 is not a procedure with which either education authorities or the medical profession desire to be associated. In fact it is rarely, if ever, interpreted in this way, but some medical officers find themselves troubled with qualms of conscience when invited to certify children whose family circumstances are poor but whose physique is apparently unimpaired. It would seem that medical selection of grantees for free milk, at least, should not be enforced, for the cost is not great and the mental, as well as the physical, benefits of extra milk rations have been so repeatedly and convincingly demonstrated among those otherwise normally fed that the case for raising the general standard of nutrition by its liberal administration is overwhelming. The British Medical Association has expressed its disagreement with the Board of Education's policy in this respect, and most school medical officers concur. The scheme could hardly be worked without an intolerable amount of friction and discontent—except in the spirit of make-believe which the Board tacitly encourages—unless the whole framework of the school medical service were radically reformed. Such a reform, involving continuous contact of the school medical department with each child throughout his school life, is perhaps desirable, but that is at the moment a reformer's dream.

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[4] Ibid., 1934, x., 83.
[5] Ibid., 1935, xi., 23.
[6] Brit. Med. Jour., June 22nd, 1935, p. 1256.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 27TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1612; diphtheria, 983; enteric fever, 49; acute pneumonia (primary or influenzal), 386; puerperal fever, 36; puerperal pyrexia, 109; cerebro-spinal fever, 15; acute poliomyelitis, 18; acute polio-encephalitis, 3; dysentery, 13; ophthalmia neonatorum, 97. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 2nd was 2611, which included: Scarlet fever, 724; diphther[illegible] fev[illegible]; [illegible]ies [illegible] neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 9 (0) from measles, 2 (0) from scarlet fever, 20 (10) from whooping-cough, 23 (3) from diphtheria, 48 (8) from diarrhœa and enteritis under two years, and 19 (4) from influenza. The figures in parentheses are those for London itself.

Again no general increase is reported in the deaths from diarrhœa and enteritis, but Liverpool reported 14 and Birmingham 3. Fatal cases of whooping-cough increase as fatal cases of measles diminish: 15 of the 20 deaths occurred in Greater London, 2 in Manchester. Liverpool reported 5 deaths from measles, Sunderland 2. Of the fatal cases of diphtheria 3 occurred at Bradford, 2 each at Tottenham and Liverpool.

The number of stillbirths notified during the week was 275 (corresponding to a rate of 39 per 1000 total births), including 38 in London.

London Association of the Medical Women's Federation.—The July meeting of this association was held at the British Postgraduate Medical School, *Ducane-road*, Shepherd's Bush. After welcoming the members to this new school, Prof. F. R. Fraser noted the broad differences between the types of clinical cases seen at Hammersmith Hospital (London County Council) to which it is attached and the voluntary hospitals. He showed some typical cases of rheumatoid arthritis, demonstrating the difference in mobility of joints and in general well-being between cases which had come under observation and treatment at an early stage and those which had been neglected. He emphasised the importance of keeping the joints moving and the value of heat, however applied, in treatment He also showed cases of osteo-arthritis and contrasted cases of heart disease in which the primary failure was on the right and on the left sides. Finally he showed a child with blue sclerotics and fragile bones. After the meeting the members were shown round the pathological department of the school.

CORRESPONDENCE

THE TOXICITY OF AVERTIN

To the Editor of THE LANCET

SIR,—The report by Dr. Cole in your last issue of a case of tetanus treated with continuous avertin anæsthesia confirms the belief of many that the toxicity of this drug to the liver has been exaggerated. Prof. Anschütz, of Kiel, informed me in 1932, and again in November, 1934, that he does not believe that avertin is a liver poison even if this organ were diseased. He continues to have good results with avertin in jaundiced patients even when the bilirubin figure is four times the normal. After operation he gives a large intravenous infusion of 5 to 10 per cent. glucose solution. He stated also that Kirschner, of Tübingen, has given 250 g. avertin to a 9-year-old boy for the treatment of tetanus.

During a recent visit to the United States and Canada, where the use of avertin is increasing, I could not obtain any evidence of liver damage. Wesley Bourne, of Montreal, who has given avertin in well over 1000 cases, is now giving it in full doses to children, doses that is to say up to 0·15 g. per kg., to obtain complete anæsthesia.

I have administered avertin on nearly 1700 occasions; no fatality has occurred which could be even remotely ascribed to liver failure. Fifty-nine patients have been operated on under avertin for disease of the biliary tract; two were suffering from jaundice and toxæmia, one due to acute cholecystitis and the other due to peritonitis; they were given full doses of avertin and made uninterrupted recoveries. In the whole series jaundice has occurred on but two occasions. An alcoholic woman was given a full dose of avertin and gas-and-oxygen with a considerable quantity of ether; the operation for removal of the gall-bladder revealed a condition of early fatty cirrhosis of the liver. Slight jaundice developed and cleared up in three days. The other case was that of a child with a long history of acidosis, whose tonsils were removed under avertin, gas-and-oxygen, and ether. He made a good recovery, but whilst in the nursing-home developed symptoms of appendicitis. Three weeks after the first operation the appendix was removed, again under avertin, gas-and-oxygen, and ether. Jaundice of a mild degree started four days afterwards and quickly cleared up. I have given avertin twice to a child in 14 hours, normal recovery ensuing. It will be noticed that both patients in my series who developed jaundice had been given ether; neither of the patients who were jaundiced at the time of operation was given ether. I am upheld in my view that ether should be avoided in these cases by Prof. Anschütz who has completely given it up for patients with severe jaundice.

The oft-quoted experiments of F. B. Parsons have, I submit, received undue attention. Prof. E. D. Adrian who reported on this work states that "his results, though negative, are of considerable value as they show that avertin has not the toxicity to the liver which seemed probable from earlier work" (Brit. Med. Jour., 1932, ii., Suppt., 170).

I am, Sir, yours faithfully,

FRANCIS E. SHIPWAY.

York-terrace, N.W., August 6th.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—In your last issue Dr. Hess Thaysen of Copenhagen has drawn attention to a peculiar visceral neurosis, which must, I think, be fairly common. A number of cases have come my way. Several have been in medical men. They tend to occur especially *at times of fatigue and stress.* I would particularly draw attention to the nocturnal incidence of the symptom, and agree with him that it is almost certainly a rectal rather than an anal phenomenon. One medical patient of mine tells me that she can obtain the quickest relief by inflation of the rectum with air, and for this purpose she keeps a rectal tube and bulb handy, both at her bedside and in her laboratory. Relief by this means suggests that the basis of the pain is probably spasm. Some of the painful colonic neuroses are similarly relieved by warm enemata.

I have notes of cases in which this tendency to acute but transient attacks of rectal pain occurred in association with colon spasm, or with other well-recognised allergic disorders. In none of my cases has there been any evidence of tabes dorsalis or of any local organic condition to explain the predisposition to these distressing crises. Not infrequently they engender a fear of organic disease, but the description of the attacks, their duration, and other associations, together with an ordinary examination usually allow a full reassurance.

I am, Sir, yours faithfully,

Wimpole-street, W., August 2nd. JOHN A. RYLE.

To the Editor of THE LANCET

SIR,—Dr. Thaysen's contribution on rectal pain is interesting, but raises one or two points which require comment. The histories of the cases cited resemble closely the stories told one by sufferers from rectal crises, so that unless a test was done in every case it would be difficult to exclude tabes as being an underlying cause. Another possible explanation of pains of such severity is dilatation of a hollow viscus. No amount of rectal dilatation will cause pain, so that it is possible that the rectal pain may be due to dilatation of a ureter, the nerve-supply, both spinal and autonomic, being similar. Extension of the pain peripherally could be accounted for by the distribution of the obturator nerve. Gravel has not the sonority of that hexameter ending proctâlgia fúgax, but I suggest that it may occasionally cause a true rectal crisis.

It is a pity that the patient who "thought he was able to detect some swollen veins in the rectum" was not further interrogated. It is impossible to feel swollen rectal veins digitally, so what ingenious arrangement enabled him to examine his own fundament?

I am, Sir, yours faithfully,

Harley-street, W., August 3rd. CHRISTOPHER HOWARD.

"NATUROPATHS"

To the Editor of THE LANCET

SIR,—In your issue of July 13th I gave an account of some recent activities of the medical herbalists. I would like to-day to refer to another cult, the "Naturopaths," who since 1934 have "established a register" which it is declared "is designed to protect the public and the fully trained naturopath from those who with inadequate knowledge claim to practise as "Nature-cure physicians."

I have before me a form of registration issued by this body on which the applicant is asked to specify types of treatment which he gives, and the following are cited as examples of such treatment: "psychoanalysis, colonic lavage, electrotherapy, biochemistry, herbal medicine, orificial surgery, &c." A circular issued with the application-form makes the following statement:—

> "Our standard of professional education is four years' full-time training with clinical experience. As the profession is still young, however, it has been impossible for many now in practice to obtain such a complete equipment. We are therefore following the example set by other young professions, and accepting proportionate experience in practice in lieu of a certain amount of training. Full information regarding both should be supplied on the printed form."

An applicant for registration may have to submit to an "examination" for which a fee of two guineas is payable on application. "Cheques to be made out to the treasurer of the Incorporated Society of Registered Naturopaths."

It seems to be common form with the irregular cults (probably in imitation of the most blatant of them, osteopathy) to name "four years' training" as the basis of "professional education," but no mention is made in the literature supplied to the applicant for registration in Naturopathy of any schools at which training can be given. The "British School of Osteopathy," "founded in 1917," posed, until its recent devastating exposure by the Select Committee of the House of Lords, as giving its "graduates" a "four years' course," the first two of which were declared to be "the same course as medical students take," and the dean of the school received the honour of publication of a half-column letter in large print in the *Times* of Nov. 6th, 1933. The recent Bill for Registration of Osteopaths gave the British School of Osteopathy the fullest recognition and proposed that it should be represented upon the board which was "to enforce a prescribed standard of education" and "keep a register similar to the register maintained by the General Medical Council," and yet the Lords' Select Committee found that the British School of Osteopathy "was exposed in the course of evidence before us as being of negligible importance, inefficient for its purpose, and, above all, in thoroughly dishonest hands."

The present rage for setting up "registers" of bodies of irregular practitioners and "schools" for their training is a phenomenon which I think deserves careful consideration by the medical profession. I have drawn the attention of the Minister of Health to the scandal presented by these schools which fraudulently pretend to qualify persons to practise various branches of medicine and surgery, and I have received to-day a letter containing his promise to look into the matter.

I am, Sir, yours faithfully,

House of Commons, August 2nd. E. GRAHAM-LITTLE.

HEADACHES

To the Editor of THE LANCET

SIR,—I am grateful for Dr. Geoghegan's kindly reference in your issue of July 20th to my Croonian lectures. As regards "neurasthenia" and "nervous exhaustion," there are two elements in any form of nervous breakdown, however slight: (1) the weakness or instability of the patient's nervous system, (2) the strain to which it has been subject. In some cases, after examination of the patient and consideration of his story, the physician forms the view that the first factor is the chief one. Among these were the neurasthenics. If the strain has been excessive and the patient is judged to have been less unstable before it than those in the first class, he is counted among the cases of nervous exhaustion. This is a clinical classification which I believe to be useful. It affects prognosis as well as diagnosis.

The word "worried" relates to external an sometimes lesser stresses in a person whose nervou system is thought to be of average stability. It i not really mine, and I do not like it. In the notes however, taken by various physicians and in th letters from the family doctors, it occurred so ofte —e.g., "worried about business," "worried abou children's health"—that I thought it better, in summary of clinical records, to put it in than t translate it.—I am, Sir, yours faithfully,

Ruthin Castle, N. Wales, July 31st. EDMUND SPRIGGS.

A LESSON IN ANATOMY

To the Editor of THE LANCET

SIR,—A neat though painful demonstration i practical anatomy which I had yesterday may interes some of your readers. While picking lavender i the garden, and sniffing it enthusiastically, I felt tingling in the left nostril. After sneezing convulsively for a few minutes, I finally blew hard an ejected an ant, which had evidently stung me Intense pain and a certain amount of swelling an lacrymation rapidly developed, and there was pai nearly as intense in the left upper alveolus and th left hard palate, illustrating most effectively th intimate connexion between the nasal branch o the mandibular nerve (second div. of the Vth) and the *anterior superior alveolar branch*. Some pain radiated into the left ear, but barely reached the eye.

What interested me was the feeling of familiarity about the pain in the alveolus, as I frequently have neuralgia there (where the teeth have long since gone); and a recurrent herpetic eruption and ulceration in the hard palate comes just where the pain was worst yesterday. I realised that I should have been treating the nose, where I did not suspect infection, for this troublesome condition. Swabbing inside the nose with hot sod. *bicarb.* solution gave a little relief, and after about an hour the pain and swelling died away.

The ant, I may say, was not dead, and I left it on the edge of my handkerchief to dry, whence it later took its departure.

I am, Sir, yours faithfully,

Princes Risborough, Bucks, August 2nd. J. WILTSHIRE.

A SALARIED SERVICE OF MIDWIVES

To the Editor of THE LANCET

SIR,—I have read in THE LANCET of August 3rd a letter from Miss Carter, organising secretary of the Midwives' Institute, and I would like to endorse all that she has to say. There can be no doubt that a salaried service of midwives will have to come and it is only right that those midwives who have been working for a number of years under unfavourable conditions should have an opportunity, as Miss Carter suggests, of being included in this service or should receive some compensation for giving up altogether.

After having watched the work of midwives for a number of years I most heartily agree with Miss Carter when she says that "it is generally recognised that midwives in this country . . . can show amazingly good results and an honourable record of the care of their patients." It is certainly high time that things were made more favourable for midwives, as the conditions under which they have been working in the past are truly deplorable and would not be tolerated by any organised trade-union for a moment. They are expected to work 24 hours a day, live in wretched quarters, and have nothing to look forward to in their old age. It is quite common for a medical man when he is called to a midwife's case to find that

that midwife has been on duty with that case 24 hours, and it is truly the duty of the medical profession to see that these things are altered. That they can be altered I have not the slightest doubt, and it appears to me that the easiest way to bring this about would be for medical men to refuse to work with any midwife who was not receiving proper remuneration and living under satisfactory conditions.

I do not think there can be any doubt that an important contributory factor to our maternal mortality is fatigue on the part of the attendant. The midwifery service of the future, I believe, will be one worked very largely by midwives who will work under proper conditions of service and will be allowed to administer to their patient some form of relief—chloroform or gas-and-air analgesia—during their labours. In this way both midwives and mothers will be greatly benefited.

I am, Sir, yours faithfully,

Station-road, New Barnet, August 2nd. JOHN ELAM.

THE EVOLUTION OF MEDICAL POLICY AND PRACTICE

To the Editor of THE LANCET

SIR,—Your leading article of August 3rd on contract practice foreshadows the development which is likely to occur. Will this be accompanied by an evolution in the present policy for the treatment of patients? There are several possibilities. Will the present system of individualism with a large measure of inevitable inefficiency be perpetuated?—That this is so now is shown by the crowded out-patient departments of the voluntary hospitals. Will there be a large extension of this system for suburban areas by municipal hospitals supported by the rates? Will there be an extension of the school medical service to deal in the first instance with adolescents and finally with adults?

Will a complete State medical service be formed to deal with all or nearly all the population? Or will doctors coöperate to provide at their own expense a first-rate medical service for the whole population, and will they make the health of all their aim in life, trusting to a wide extension of the insurance system to make this possible?

Medical work has become more exact and needs expensive apparatus and workers specially trained to use it. This is true not only for X rays and microscopy but also for investigating those areas in the body where special forms of illumination are needed. No single general practitioner or specialist is likely to be able to provide all the apparatus for the newer forms of physical treatment. A group of practitioners and specialists could do so? A "medical house" with a clerical staff, consulting-rooms, and nurses, a laboratory, X ray room, baths, and electrical treatment rooms would replace the usual consulting-rooms found in the houses of most doctors. The standard of practice where one of these existed would be raised in a whole district.

An imperfect analogy may make clear the main point in my mind. When a motor car needs attention would we prefer to take it to a small garage or to a modern service station? A motor car is simplicity itself compared to our bodies.

I am, Sir, yours faithfully,

August 5th. A. R. FRIEL.

BLEEDING OF TRANSFUSION DONORS

To the Editor of THE LANCET

SIR,—I have tried several devices for facilitating the removal of blood from the donor's vein, including the use of a pump. My present choice is not a complicated apparatus, but something very simple. I use an ordinary stainless Record needle, No. 15 B.W.G., with a sharp point and a short bevel, attached to about two feet of rather narrow rubber tubing, No. 10 Arnold. About six inches from the needle the length of tubing is broken by a glass connexion which acts as a window. At the operation the tubing hangs loosely and therefore almost vertically into a flask held just above floor level by an assistant. I have found that a pint of blood can almost invariably be collected in under ten minutes with the greatest ease. I think the secret lies in the long tubing which acts as a siphon.

In giving blood to the recipient, there is one problem which I believe has not yet been solved—how to insulate that tubing between the flask and the patient's arm to prevent the blood from cooling. Both a short tube and wrapping round the tube obstruct the ease of approach to the vein. I suspect cooling of the blood is one factor in subsequent reactions, and hence the problem is of importance.

I am, Sir, yours faithfully,

Nottingham, August 5th. P. H. O'DONOVAN.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Summer Adjournment

ON August 2nd both Houses of Parliament adjourned for the summer recess until Oct. 29th. Resolutions were passed to the effect that both Houses may meet at an earlier date at the discretion of the Lord Chancellor and the Speaker of the House of Commons. In the House of Lords the Royal Assent was given to 95 Acts, including the following: Appropriation Act, University of Durham Act, Diseases of Animals Act, Criminal Lunatics (Scotland) Act, Public Health (Water and Sewerage) (Scotland) Act, Housing Act, Housing (Scotland) Act, Government of India Act, National Health Insurance and Contributory Pensions Act, Restriction of Ribbon Development Act, Ministry of Health Provisional Order Confirmation (Leigh Joint Hospital District) Act, Ministry of Health Provisional Order Confirmation (Cuddington Joint Hospital District) Act, Ministry of Health Provisional Order Confirmation (Fylde, Preston and Garstang Joint Small-pox Hospital District) Act, Ministry of Health Provisional Order Confirmation (Ottershaw Joint Hospital District) Act, Hertfordshire County Council Act, and St. Bartholomew's Hospital Act.

On Wednesday, July 31st, the Voluntary Hospitals (Paying Patients) Bill was read a second time in the House of Commons.

University of Durham Commission

Under the University of Durham Act, 1935, which has now received the Royal Assent, the following Commissioners are entrusted with making Statutes for the University and its constituent Colleges: The Rev. F. H. Dudden, D.D. (chairman), Countess Grey, C.B.E., Sir W. Ross Barker, K.C.I.E., C.B., Mr. J. H. Priestley, D.S.O., Mr. C. Williams, O.B.E., M.A., Mr. G. R. Murray, M.D., D.C.L., F.R.C.P., Mr. T. F. Sibly, D.Sc. LL.D., Mr. A. Wood, D.Sc., with Mr. A. C. Dawes, B.A., LL.B., as secretary.

A New Attested Herds Scheme

In the House of Lords on Aug. 1st Earl DE LA WARR, Parliamentary Secretary to the Ministry of

Agriculture, admitted that the Attested Herds Scheme was not being taken up by the average farmer. They were, therefore putting forward proposals for altering the scheme. In addition to the bonus of one penny per gallon on milk from attested herds sold through the provisions of the Milk Marketing Scheme it was proposed to offer additional financial assistance to herd owners in suitable cases. Where an owner could produce veterinary certicates showing that he had reduced the number of reactors to the tuberculin test in his herd to not more than 10 per cent. the Ministry would be prepared to consider an application for a contribution towards further tests of the herd up to a maximum of four tests in order to assist the owner to complete the eradication of the disease and enable him to qualify for attestation. The contribution would be at the rate of £1 1*s.* plus 2*s.* 6*d.* for each animal tested in respect of each herd test.

Secondly, in place of the single official test at present required to determine the final qualification of a herd for a certificate of attestation, the Ministry would be prepared, in cases in which one or more reactors were found at such test, to repeat the official test at intervals of between 60 and 90 days for a maximum of three further herd tests before refusing the application. The cost of all official tests was defrayed by the Ministry.

Thirdly, herds undergoing a series of assisted or official tests under the foregoing provisions would be termed supervised herds and be subject to certain rules for the purpose of preventing the reintroduction of infection. To assist the owners of these supervised herds to obtain the right type of cattle to replace reactors the Minister would be prepared to make a contribution of from £3 to £5 towards the cost of replacing a reactor of the same class, except that no contribution would be paid towards the cost of an animal under 21 months' old unless the animal was a bull which had been licensed by the Ministry under the Improvement of Livestock (Licensing of Bulls) Act. The larger sum of £5 would be contributed towards the cost of obtaining an animal from an attested herd, £3 being the amount of the contribution in respect of an animal from any other herd. It was estimated that in the case of the average herd containing, say, twenty milking cows, the contribution towards the cost of testing would be £38, and on the assumption that a contribution would be made in respect of eight reactors on the average for each supervised herd the amount of such contribution towards the replacement of reactors would be £32, bringing the total additional financial assistance thus afforded to about £70. The operation of these provisions would be carefully watched, and in any event they might only be available during the period of four years specified in Section 9 of the Milk Act, 1934.

The intention of these proposals was to afford special assistance to the owners of suitable herds to complete the task of cleaning up their herds with a view to qualifying for attestation as tubercle-free herds, and it was hoped that they would produce a satisfactory response from herd owners.

Alcohol and Motor Driving

In the House of Commons on Aug. 2nd, on the motion for adjournment, Mr. ISAAC FOOT called attention to the report recently issued by the British Medical Association in answer to a request from the Minister of Transport (see THE LANCET, Aug. 3rd, p. 259) on the question of the effect of alcohol on motor drivers. The importance of the report lay in the attention it drew to the effect of the subintoxicant dose of alcohol, an amount less than that customarily regarded as rendering a person under the influence of drink or incapable of having proper control of a vehicle. The real danger upon the roads was not the drunken man but the man who was in charge of a dangerous machine and who had taken sufficient alcohol to give him a false confidence. There was, he thought, a definite obligation on the Ministry of Transport, and indeed on the House of Commons, to see that those facts were made known to all concerned. The fact that something like 80 to 90 per cent. of the municipalities of the country, and the great public utility companies, made abstinence a condition of service for men who were driving vehicles or acting as conductors was in itself conclusive evidence. He suggested that the report should be more widely published.

Captain AUSTIN HUDSON, Parliamentary Secretary to the Ministry of Transport, agreed that the more publicity the report obtained the better the effect would be. Between the time when the report was asked for and the time when it was received the Ministry, he said, inserted in the Highway Code a reference to the use of alcohol which said: "Before using the road be sure that your alertness or sense of caution is not affected by alcohol or fatigue." The Highway Code had a circulation of some 13,000,000 or 14,000,000, and was being widely read. He thought that Mr. Foot was wrong in thinking that the Ministry were not giving enough publicity to this question of alcohol. In the B.M.A. report the last sentence of all was, he thought, the most important. This ran:

> "After taking alcohol he may believe himself"—that was the driver—"to be driving better, but in fact, his body works less efficiently. This adverse effect generally occurs even if alcohol is taken in moderate quantities some hours before driving, and especially if taken in the absence of food."

He hoped that publicity would be given to that statement.

HOUSE OF COMMONS

WEDNESDAY, JULY 31ST

Nursing-homes and Traffic Noise

Mr. LENNOX-BOYD asked the Minister of Transport whether he was aware that there were one or more streets in London wholly occupied by nursing-homes and institutions; and whether, in the case of such streets, he would consider controlling heavy traffic, at any rate during the hours of the night and early morning.—Mr. HORE-BELISHA replied: If my hon. friend will furnish me with the names of the streets he has in mind I will have the matter examined.

Alcohol and Motor Driving

Sir FRANCIS FREMANTLE asked the Minister of Transport if he had considered the report of the committee of the British Medical Association on the influence of alcohol on motor driving; whether he would issue the report for the use of members of Parliament; and what action he proposed to take in the matter.—Mr. ISAAC FOOT asked a similar question.—Mr. HORE-BELISHA replied: The report to which my hon. friends refer was issued with the *British Medical Journal* for July 27th, and is therefore generally available. The report does not itself suggest to me any definite line of action, but I am sure that the public will be grateful to the British Medical Association for the time and trouble they have taken in carrying out this inquiry, and for the interesting material which it contains.

Dwelling-houses and Air Raid Protection

Mr. NEIL MACLEAN asked the Home Secretary the estimated cost of making the rooms in an average sized dwelling-house gas proof against air raids.—Sir J. SIMON replied: The cost of protecting rooms against gas would vary according to the size and construction of each room, the number of windows and doors and the state of repair. It is not contemplated that in an ordinary house more than one room should be made fully gas proof, but in addition a double gas-proof door, or air-lock, should be provided at the outer door of the house. I am advised that the cost of materials needed to construct this air-lock and to protect one room that was in reasonably good repair ought to be less than £1, exclusive of blankets and rugs which might be assumed to be available in the house. I am having special investigation made of the simplest methods of providing the necessary protection so that the cost of materials may be kept to a minimum and that the ordinary householder may, if he wishes, do the work himself.

THURSDAY, AUGUST 1ST

Miners' Nystagmus and Workmen's Compensation

Mr. GODFREY NICHOLSON asked the Home Secretary the terms of reference and the name of the chairman of the committee which he proposed to appoint to inquire into the operation of the Workmen's Compensation Act in relation to workmen affected by miners' nystagmus.—Sir J. SIMON replied: Briefly, the matters on which the committee will be invited to report are the operation of the Act in relation to miners' nystagmus; the position of the medical referees under the Act, and the arrangements generally for dealing with medical issues, and certain important questions arising in connexion with the settlement of claims by payment of lump sums. I am glad to state that His Honour Judge Stewart has consented to act as chairman of the committee.

Hospital Patients and Precautions against Air Raids

Mr. DOBBIE asked the Home Secretary whether, in the provision of gas masks for protection of the civil population during air raids, arrangements would be made for masks of a size and kind suitable to children; and if arrangements were being made to safeguard patients in hospitals and institutions where the inmates were unable to look after themselves.—Captain WALLACE, Under-Secretary, Home Office, replied: Yes, Sir; these matters will be considered.

Mr. MORGAN JONES asked the Home Secretary whether the gas-mask which was being advised by the Government for use by the civilian population would be able to resist the action of suffocating vesicant and corrosive gases; for how long the masks would offer protection in use; and whether materials were available for the making of such gas-masks in quantities for the whole civilian population, with quantities sufficient to allow for reserves and for deterioration and damage.—Captain WALLACE replied: The Government will only recommend the use of respirators which will afford protection against all known forms of gas which it would be practicable to use in war, for periods believed to be sufficient for the wearers to reach safety. Persons who might have to remain at work in gassed areas would need respirators giving a longer period of protection. It is not at present possible to quote precise figures of the duration of protection of different types of respirators. There is no reason to anticipate any difficulty in the supply of materials for the full number of respirators required.

Milk-supplies to Hospitals

Mr. LEONARD asked the Minister of Agriculture if he was aware that the vice-chairman of the Scottish Milk Marketing Board had stated that the Board were sympathetic to the request of hospitals and infirmaries for a special rate for milk-supplies, but were restrained by the fact that legislation bound them only to apply special rates to what could be termed a new demand; and if he would amend the Act so as to permit public institutions to have the advantage of special terms for milk.—Sir GODFREY COLLINS replied: The statement referred to has not come under my notice, but it is doubtless the case that the Scottish Milk Marketing Board are not in a position to give special terms to the hospitals and other such institutions in the absence of provision for Government assistance for such a purpose in the Milk Act, 1934. As stated in reply to previous questions, the matter raises large issues of policy, which will have to be considered in conjunction with the report of the Milk Reorganisation Commission.

Paratyphoid in Essex

Mr. THORNE asked the Minister of Health if he could give any information in regard to the outbreak of paratyphoid at Grays, Essex, and neighbouring towns; what action was being taken to prevent the disease from spreading; and what was the cause of the outbreak.—Sir KINGSLEY WOOD replied: I understand that 21 cases of paratyphoid were notified in the urban districts of Grays Thurrock, Purfleet, and Tilbury, and the rural district of Orsett, in the six weeks ending July 27th. The outbreak has been under investigation by the medical officer of health and a visit has been paid by a medical officer of my department. All cases were promptly isolated and the routine disinfection carried out. The cause of the outbreak has not yet been determined but investigations are still in progress.

OBITUARY

DAVID RICE, M.D. Brux., M.R.C.S. Eng., D.P.H.

WE regret to record the death of Dr. David Rice which occurred on Wednesday, July 31st, at Lower Hellesdon, where he had been lying ill for some three months. He was the son of the Reverend C. H. Rice, rector of Cheam, and was educated at St. Columba's College, Dublin, and Guy's Hospital. He took the English double qualification in 1898 and immediately started on his successful career as an alienist. He was for a time attached to the Bethlem Royal Hospital, and from 1899 to 1907 he was medical officer at Staffordshire County Asylum. He was later appointed medical superintendent of the Hellesdon Hospital, Norwich, a post which he held for 27 years, acting also as medical adviser to the Norfolk Committee for the Care of the Mentally Defective. He was particularly well read in his subject, was up to date in his views, and a capable administrator, so that he gained rightly a high reputation for his achievement at Hellesdon. Outside his professional work Dr. Rice was a great lover of music, while he had been a prominent cricketer. He leaves a widow, two sons, and a daughter.

EDWIN ALBERT CHILL, O.B.E., M.D. Edin.

THE death occurred suddenly on July 23rd of Dr. E. A. Chill, at his home at Battle where he was living in retirement. He was born in Burma in 1861 and educated at King's College School, London, proceeding for his medical training to the University of Edinburgh. He graduated in 1883 as M.B., C.M., proceeded to the M.D. degree, and held several appointments in London as clinical assistant, notably at Great Ormond-street Children's Hospital and the Central London Throat, Nose, and Ear Hospital. He was then for a period in practice in Ealing, a member of a very successful firm, and during the war as a captain R.A.M.C. was commandant of the Ealing V.A.D. auxiliary hospital at Southall. His connexion with the V.A.D. was important, for he was chief commandant of the Middlesex organisation and assistant county director of the British Red Cross and Order of St. John. At the conclusion of hostilities he received the O.B.E. He was a prominent freemason and published at various times lectures on anthropology and freemasonry.

ALFRED JOSEPH McCONNELL, M.B., Ch.B. Edin.

Dr. A. J. McConnell was born in Ballymena, Antrim, in 1886, the son of William McConnell, of Trostan, Ballymena. He was educated at Ballymena Academy and received his medical training at the University of Edinburgh. He graduated in 1909 as M.B., Ch.B., and following his qualification held the post of assistant resident medical officer at Smithdown-road Hospital, Liverpool, until 1912. He then settled down in general practice, but on the outbreak of war joined the R.A.M.C. with the rank of captain and served with the corps from 1916 until the conclusion of hostilities, spending the greater part of the time in Salonika. After the war he returned to Liverpool and resumed his practice, which he was carrying on at the time of his death, which occurred after a short illness at the age of 49.

J. C. R. writes: "The district of South Liverpool and those of his colleagues who knew him regret sincerely the recent death of Dr. A. J. McConnell. He was one of the most unassuming men in Liverpool, but both colleagues and patients alike were invariably impressed by his genial personality and unobtrusive kindliness. He was especially expert in midwifery, and many patients have good cause to thank him for his skill and judgment. He leaves a widow and a family of six children, two of whom are medical students."

ARTHUR ALAN MILLER, M.D. Durh., L.R.C.P. Lond., M.R.C.S. Eng.

Arthur Alan Miller, who died on July 17th, had been in ill-health for some time though remaining courageously at work.

The second son of the late G. W. Miller, he was born in 1874 and educated at Forest School, Walthamstow, entering Guy's Hospital in 1893 where he had a successful medical career as a student. He was one of the most popular men who ever entered Guy's, for he was a clever amateur actor and also a good dramatic writer. He had a very large share in the Guy's Hospital paper, "The Guyoscope," the most successful of all hospital comic issues while it lasted. Thus he was invaluable at all hospital concerts and dramatic entertainments, and Mr. Eason, the superintendent of Guy's, writes that no one in the last generation has ever quite filled his place in the social life of the hospital. After qualification he was house physician at the General Infirmary, Northampton, and later took the degree of M.D. Durh. He now practised for a few years in Sutton, but moved to Westminster not long before the war, and while practising there and also in the City of London he published a book on the care of children, a subject where he was able to show the practical knowledge gathered from an appointment at the Evelina Hospital.

Early in the war he joined the R.A.M.C., and saw varied service in casualty clearing stations in France, Mudros, Egypt, and Italy, and was mentioned in dispatches. The end of the war found him acting lieut.-colonel in command of a casualty clearing station on the Italian front, and later he served for six years at the Ministry of Pensions. He then resumed his practice in the City where he was medical adviser to several important banks and companies.

In 1924 he married Eleanor, daughter of the late Rev. J. C. Street, and leaves a young son.

Throughout his life Dr. Miller remained interested in the stage. He wrote several sketches for Arthur Roberts and George Graves, and among his plays was "The Gipsy Princess," "A Night Out," "The Early Girl," and "Motherhood," while in conjunction with George Arthurs he wrote the Aldwych farce, "Marry the Girl."

MEDICAL NEWS

University of Oxford

On August 3rd the degree of B.M. was conferred on N. E. R. Archer, A. Fearnley, A. H. Hunt; T. W. H. Porter, and K. C. Royes.

University of Cambridge

The John Lucas Walker studentship for original research in pathology has been awarded to Mrs. M. E. Adair, Ph.D., who was recently a junior Beit memorial fellow. The Gwynaeth Pretty studentship for the encouragement of research in the ætiology, pathology, or treatment of disease, and the Nita King research scholarship for original research in the ætiology, pathology, and prevention of fevers have both been awarded to Dr. Reginald Passmore.

On August 3rd the following degrees were conferred :—

M.D.—G. J. V. Crosby.

M.B., B. Chir.—G. Blackburn, S. M. Evans, M. Hynes, H. B. D. Kettlewell, H. T. Laycock, C. W. A. Searle, T. M. Tyrrell, and J. N. Warren.

M.B.—W. S. Haynes, H. J. M. Robinson, and R. J. Still.

B. Chir.—A. W. Abramson, T. G. Armstrong, C. E. Bevan, W. G. Brander, G. R. Debenham, T. S. R. Fisher, A. R. Kelsall, W. A. Law, P. E. C. Manson-Bahr, J. H. Stothert, G. C. Tooth, and J. G. Webb.

University of London

Mr. Maxwell Ellis has been re-elected to the Duvene studentship in oto-rhino-laryngology for a further year. At the M.B. examination in May the university medal was awarded to Graham Hayward of St. Bartholomew's medical college.

At recent examinations the following candidates were successful :—

M.D.

Branch I. (Medicine).—F. R. Bettley, Univ. Coll. Hosp.; C. R. Birnie, King's Coll. Hosp.; K. C. Buck, St. Mary's Hosp.; Anthony Caplan, St. Bart.'s Hosp.; S. B. Dimson, Univ. Coll. Hosp.; A. E. Francis, St. Bart.'s Hosp.; D. H. Fulton, King's Coll. Hosp.; T. G. F. Hudson, St. Thos. Hosp.; I. G. Jones, Univ. Coll. Hosp.; Alexander Kahan, St. Thos. Hosp.; C. B. Lanyon, Univ. Coll. Hosp.; L. J. M. Laurent, Univ. Coll. and Univ. Coll. Hosp.; H. G. McComas, Guy's Hosp.; Ian More and R. S. Ogborn, Univ. Coll. Hosp.; Ruth Pumphrey, Univ. Coll. and Univ. Coll. Hosp.; R. S. Risk, St. Bart.'s Hosp.; K. M. Robertson, St. Thos. Hosp.; V. E. P. Senewiratne, Ceylon Med. Coll. and Univ. Coll. Hosp.; Rupert Shelley, St. Thos. Hosp.; Rupert Sykes, Victoria Univ. of Manch.; Joan B. Walker, Lond. (R.F.H.) School of Medicine for Women; Mary J. Wilmers, King's Coll. Hosp.; and J. L. Woodhouse, Guy's Hosp.

Branch II. (Pathology).—N. F. Maclagan, Middlesex Hosp.

Branch III. (Psychological Medicine).—J. G. Hamilton, Lond. Hosp.

Branch IV. (Midwifery and Diseases of Women).—Olive M. Midgley, London (R.F.H.) School of Medicine for Women; L. N. Reece and C. P. Scott, St. Thos. Hosp.

Branch V. (Hygiene).—V. F. Anderson, Westminster Hosp.; and Edith J. R. Browne, London (R.F.H.) School of Medicine for Women.

Branch VI. (Tropical Medicine).—K. V. Earle, Univ. of Camb. and St. Thos. Hosp.; and E. G. Wilkins, Middlesex Hosp. and London School of Hygiene and Tropical Medicine.

University of Bristol

The degree of M.D. has been awarded to A. C. Fisher for published work.

English Conjoint Board

At the recent final examination of the Board the following candidates were approved in the subjects indicated, but are not yet eligible for the diplomas of the colleges :—

Pathology.—O. B. Alakija, G. W. Alderman, J. D. F. Armstrong, Mary Barker, R. H. Barrett, E. A. Beet, R. H. Bembridge, C. Berens, Lily Black, E. Bolton, E. S. Bompas, G. L. Broderick, J. M. Brown, J. W. F. Brown, L. S. Calvert, P. C. Calvert, G. D. Channell, S. H. C. Clarke, J. C. Coates, W. A. Cobb, J. O. Collin, F. C. Collingwood, S. M. Cornes, B. K. Das Gupta, W. Davidson, D. L. Davies, L. E. C. Davies, W. H. Davies, L. J. D'Souza, J. Diver, H. G. Dowler, J. J. Dubash, P. S. Edgecombe, G. M. Fleming, H. R. W. Franklin, Joyce M. George, W. W. Gilford, E. Gillett, E. Gill-Carey, A. Gomez, A. C. F. Green, J. B. M. Green, L. Greenbaum, K. Hamiduddin, H. E. W. Hardenberg, A. J. Hardy, K. H. Harper, E. W. Hart, C. W. M. Harvey, F. E. S. Hatfield, W. H. Hayes, L. Heasman, R. K. R. Henry, A. G. W. Hill, J. E. Hill, G. T. Holroyd, T. H. Hughes, K. F. Hulbert, C. W. Hutt, G. A. Jackson, T. G. S. James, T. P. N. Jenkins, T. E. Johnson, H. Josephs, M. A. Kader, L. U. Kamm, E. Kaplan, R. G. M. Keeling, A. R. R. Kent, B. S. Kent, F. B. Kiernander, J. D. Kinnear, W. J. Latham, J. Lawson, A. R. Lee, I. Libman, A. B. Lintott, H. R. Loughran, A. A. Lovell, L. G. Lyle, L. McAskie, I. T. McGaw, D. H. Mackay, J. Mackellar, H. K. Meller, P. J. W. Mills, G. D. N. Milne, J. S. Minett, J. G. Mitchell, K. W. Monks, A. G. Moore, F. T. Moore, D. W. Moynagh, J. T. Murray-Aynsley, J. A. V. Nicoll, M. J. O'Donnell, M. G.

O'Flynn, N. O. Paterson, Nora M. Pettitt, W. J. E. Phillips, G. C. L. Pile, F. E. Pitt-Payne, Faith C. Poles, Helen S. Polson, Dorothy S. Pope, M. Price, P. J. Purcell, J. Razonsky, A. Reeves, J. L. D. Roberts, D. W. Rossiter, G. R. Royston, S. Sambandam, D. M. Samuel, H. V. Sankarayya, M. Schalat, G. E. B. Scott, J. S. H. Scott, Marjorie Smail. J. I. M. Smith, E. H. J. Smyth, J. B. Spearman, G. C. Steel, D. H. Swayne, R. D. Teare, R. F. Tredgold, R. C. Tudway, J. R. T. Turne, J. Vahrman, G. J. van der Merwe, G. O. Walker, S. Weinstcok, T. E. Whitby, A. M. Williams, H. T. H. Wilson, J. R. J. Winter, Ursula W. Wood, and C. A. Young.

Medicine.—M. A. Ahmad, I. C. Allen, S. Balasingam, E. J. W. Barnard, R. H. Barrett, P. N. Baruah, Agnes Y. Bowie, Josephine H. Campbell, S. S. L. Chiew, Priscilla B. Clark, J. D. Cooper, N. Cruickshank, G. G. Doel, J. J. Dubash, G. H. Ellis, Joan R. Franklin, D. W. F. Gotla, R. L. Hartley, R. A. Hoey, C. A. Hutt, M. Inayat-Ullah, J. I. A. Jamieson, H. G. Jones, D. B. Kulkarni, M. Lipson, H. S. Lohgarh, Ivy M. Massick, F. T. Moore, D. W. Moynagh, Moira Murray, J. A. V. Nicoll, Nora M. Pettitt, Dorothy S. Pope, R. R. Prewer, B. Robbins, W. A. H. Rushton, H. N. Savage, S. K. Sen, D. Singh, R. Srinivasan, J. S. Stuart, F. J. E. Stuhl, J. R. Sweeting, R. F. Tredgold, J. H. Ward, A. G. Waters, H. Weiner, Sheila M. R. Williams, S. L. Williams, and E. G. Williamson.

Surgery.—M. M. Ali, G. A. Armstrong, E. J. W. Barnard, H. F. Barnard, J. E. M. Barnes, F. G. A. Beckett, L. J. Blay, A. W. Bone, J. C. B. Bone, R. E. Bonham-Carter, C. M. Bowker, S. C. Buck, D. H. D. Burbridge, S. S. L. Chiew, T. K. Cooke, H. W. F. Croft, M. Curwen, B. J. Doran, C. H. Drake, T. P. Eddy, T. H. T. Gautby, T. D. Fraser, S. E. Furber, M. Gaba, D. R. Gibson, G. N. St. J. Hallett, R. L. Hartley, A. G. Hemsley, G. H. M. Hemsted, M. C. B. Heyns, B. B. Hickey, W. A. T. Hill, R. J. House, W. Hughes, C. W. Hutt, J. I. A. Jamieson, R. A. Johnson, W. E. Kershaw, F. B. Kiernander, M. Krone, J. W. Lacey, C. Langmaid, B. Lee, M. Lewis, R. G. M. Longridge, R. D. McDonald, K. G. F. Mackenzie, M. Mirsky, N. H. M. R. Monro, R. Mundy, R. O. G. Norman, K. J. O'Connor, T. D. W. O'Flynn, G. W. Palmer, N. O. Paterson, E. N. Pearlman, G. B. S. Pimblett, Faith C. Poles, A. R. Pritchard, C. N. Pulvertaft, Shila G. Ransom, C. O. Ribeiro, Florence G. Richards, O. N. Roussel, J. W. R. Sarkies, J. A. Seymour-Jones, G. C. Steel, B. P. Stone, A. R. F. Thompson, R. G. Tuke, G. J. Van der Merwe, W. M. Van Essen, C. S. Van Heerden, Rosemary C. Walker, J. St. J. F. W. Wallace-Collett, G. Williams, W. H. Wolstenholme, and D. E. Yarrow.

Midwifery.—P. A. Allsopp, G. S. Arnold, W. K. Badgett, F. J. S. Baker, H. H. F. Barns, L. Bass, A. B. Baxter, F. G. A. Beckett, E. A. Beet, E. D. Belbin, A. M. Best, F. A. Bleaden, T. F. Bostock, C. M. Bowker, R. F. Braithwaite, J. M. Brown, I. S. Buchanan, G. L. Burgess, J. C. Busby, L. S. Calvert, H. W. Chaifetz, S. R. Chandra, G. D. Channell, R. Chignell, Priscilla B. Clark, E. P. Clarke, J. W. Clegg, J. C. Coates, H. W. F. Croft, J. E. A. David, D. A. Davies, Phillis Dingle, J. Diver, H. G. Earnshaw, C. H. C. Ferguson, G. M. Fleming, Daireen I. Forster, J. P. Fox, J. E. Garson, R. G. Gibson, W. W. Gilford, D. L. H. Goddard, G. Gray, M. A. Hai, T. A. Hale-Monro, H. E. W. Hardenberg, E. W. Hart, G. A. Hart, E. I. B. Hawes, L. Heasman, B. B. Hickey, J. D. N. Hill, G. T. Holroyd, K. F. Hulbert, W. L. Isaac, G. A. Jackson, S. Jackson, W. H. Jopling, H. Josephs, D. Kendall, A. R. R. Kent, B. S. Kent, W. E. Kershaw, E. E. K. Kilvert, A. I. Kinnear, J. D. Kinnear, D. J. Lapping, L. R. Leask, E. E. Lefeuvre, J. B. Lobo, J. M. Lockett, H. S. Lohgarh, S. W. Longthorne, H. R. Loughran, P. D. Lynch, R. I. Macbeth, G. L. St. A. McClosky, D. H. G. MacQuaide, M. A. Margo, S. C. Mehta, G. D. N. Milne, J. S. Minett, P. D. Mohandirange, F. T. Moore, T. J. Morton, T. P. Myles, M. J. O'Donnell, M. G. O'Flynn, J. D. Ogilvie, W. A. Oliver, Helen M. C. Palmer, S. N. Paranjpe, J. Pemberton, J. W. Pierce, F. E. Pitt-Payne, O. N. Ransford, A. H. M. Richards, G. Rigby-Jones, Annie I. B. Ross, B. M. D. Rosten, K. G. Rotter, J. K. Salmon, L. J. Sandell, M. Schwartz, I. B. Sen Gupta, W. P. Shemilt, D. Singh, M. R. Singh, R. Srinivasan, F. Stansfield, D. E. Stephens, W. H. Stephenson, W. Stoddart, G. K. Taylor, D. T. Thomas, F. B. Thomas, A. R. F. Thompson, R. F. Tredgold, R. C. Tudway, J. R. T. Turner, J. E. Underwood, W. M. Van Essen, J. R. Wardley, R. N. E. Watt, W. R. Welply, C. Weston, H. T. H. Wilson, Louise F Wilson, G. N. Wright, and P. J. M. Wright.

Scottish Conjoint Board

At recent examinations by the board of the Royal Colleges of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow, the following candidates were successful :—

F. C. Alexis, Paul Anyos, S. F. Aron, Komarraju Atchamamba, G. B. Beckner, W. M. Bennett, W. J. M. Beveridge, Aaron Caplan, A. S. Chiekrie, N. G. Clements, Michael Cohen, Hans Cohn, Albert Conn, Michael Dinner, A. H. Dobbin, A. H. Elder, I. J. Fernando, Harry Fischgold, J. A. Geerthsen, V. W. C. Gordon, J. E. Greene, H. R. Hagemann, Emmy Hahn, Meyer Hammer, D. T. Herkus, H. K. Hosny, H. N. Katz, T. S. B. Kelly, Ludwig Kleeberg, L. L. Kramer, Johan Kruger, Anna Lewin, Antony Lucas, Ilja Margolin, Ann W. M. Miller, Marjorie B. Morton, O. W. Nelki, C. B. Phillips, B. de F. Pieris, Egon Plesch, Abraham Rabinowitz, P. S. Reisman, L. A. St. L. Richards, Peter Salsberg, N. A. Samuels, M. J. A. Sandrasagra, Abraham Shechtman, H. B. Silverman, Herbert Simon, Simon Smulowitz, O. J. Sokoloff, L. N. Soon, Jack Squire, Hedwig Stern, Kurt Stern, W. P. Steyn, Samuel Stromberg, T. H. Thompson, A. S. Torrance, Ernst Widrich, G. E. W. Winter, and Ilja Wolpert.

Walsall General Hospital

Representatives of workpeople have visited this hospital to see how the money they collect is expended. The two new wards were made possible through the help of the workpeople's contributory fund.

King's College Hospital

Mr. Cecil P. G. Wakeley has been appointed by the council of King's College to be their representative upon the committee of management of King's College Hospital, in the place of Prof. E. Barclay-Smith, M.D., who served in that capacity for twelve years.

King's College Hospital Centenary

In 1939 King's College Hospital will celebrate its hundredth anniversary. It is over twenty years since the hospital moved from its original home in Portugal-street to Denmark Hill, the site of 12 acres being presented by the late Lord Hambleden.

Research Fellowships in Tuberculosis

The Medical Research Council have awarded Dorothy Temple Cross fellowships for the academic year 1935–36 for research in tuberculosis to Mr. G. B. Brook, D.Sc., senior assistant veterinary officer, Derbyshire county council ; Dr. J. W. Craig, assistant medical officer, King Edward VII. Sanatorium, Midhurst ; and Dr. A. H. B. Rhodes, house physician, Brompton Hospital.

Paddington Medical Society

A meeting of this society will be held on Tuesday, August 13th, at 9 P.M., at the Great Western Royal Hotel, Paddington, W., when there will be a clinical discussion by members on case problems in general practice.

National Hospital, Queen-square

A course of lecture-demonstrations on neurology will be held at this hospital from Oct. 7th to Dec. 6th. It will include demonstrations of anatomy, physiology, and pathology, and demonstrations on post-mortem material at noon ; lectures on the principles of neurology and on diseases of the nervous system at 3.30 P.M. ; and demonstrations of clinical methods of examination at 5 P.M. A second course will be held from Jan. 27th to March 27th. Further particulars may be had from the secretary of the hospital, Queen-square, London, W.C.1.

Invalid Children's Aid Association

This association will hold a joint conference with the Central Council for the Care of Cripples on the welfare of cripples and invalid children on Nov. 7th and 8th at the Drapers' Hall, Throgmorton-street, London, E.C. The conference will be opened by Sir Kingsley Wood, the Minister of Health, and the first session will be devoted to a discussion of infectious diseases, their after-effects, immunisation, and other preventive measures. The speakers will include Sir John Broadbent, Dr. Matthew Burn, Surgeon-Captain Sheldon Dudley, Dr. J. Alison Glover, and Dr. W. J. Pearson. At other meetings the after-effects of accidents will be discussed, and the speakers will include Dr. H. C. Cameron, Dr. Elizabeth Casson, Mr. S. A. S. Malkin, Dr. H. E. Moore, and Mr. Donald Norris. Further information may be had from the secretaries of the associations, 117, Piccadilly, W.1.

Presentations to Medical Men

On his retirement from the post of principal medical officer of the Welsh Board of Health, Dr. D. Llewellyn Williams received a presentation from the Welsh branch of the Society of Medical Officers of Health, meeting in Cardiff last month under the presidency of Dr. Thomas Evans, of Swansea. Dr. D. Rocyn-Jones, in speaking of Dr. Williams's great services to the public health service, recalled the time when there were only three county medical officers in Wales—Dr. Williams, Dr. W. Williams, of Glamorgan, and himself. Other speakers included Prof. R. M. F. Picken, Dr. Colston Williams, Dr. Dan Powell and Dr. T. B. Smith.—In the city council chamber at Leicester, on July 26th, Dr. C. Killick Millard received presentations and an illuminated address in recognition of his work as medical officer of health. References were made to his unselfishness and generosity and to the magnificent success that has attended his efforts to lower mortality and increase health. In the course of his reply Dr. Millard remarked that if he were dictator the first thing he would do would be to bring in compulsory superannuation.—After 21 years at Ravensthorpe, in Yorkshire, Dr. James A. Stewart is retiring to live at Brighton, and last month a meeting was held to express the respect and affection of the townspeople among whom he has been working. Part of the presentation was made on behalf of the local ambulance brigade, in which Dr. Stewart has successfully trained 200–300 candidates for examination.

NOTES, COMMENTS, AND ABSTRACTS

THE SIGNIFICANCE OF PERSISTENT HIGH BLOOD PRESSURE [*]

By L. N. Jackson, M.C., D.M.

I PROPOSE in this paper to deal with persistent arterial hypertension from the point of view of prognosis, and I have chosen this subject and this particular aspect of it for several reasons. I have chosen it first, because, I think, prognosis is a branch of medicine about which the general practitioner ought to know more than his consultant colleagues, since he has better opportunities of following up cases until they finally perish under his care. Secondly, I have chosen it because I believe that as prognosticians we doctors have a definite civic function to perform, quite apart from any other uses we may have to the community. If we cannot cure a patient we ought at least to be able to forecast with some degree of accuracy what measure of health he is likely to enjoy, and when he may expect to die, so that he may put his affairs in order. My third reason is that I happen to have been interested in essential hypertension for a number of years. It has been a sort of hobby of mine. Just as one man may collect stamps or old china, so may another collect hyperpietics. Finally, I have chosen it because, it seems to me, that many of my own and previous generations in the profession are hazy about the significance of persistent hypertension.

Persistent arterial hypertension nowadays is usually classified as follows :—

1. *Renal hypertension*, the type found in association with certain cases of that variety of Bright's disease usually known as chronic glomerulonephritis.

2. *Non-renal hypertension*, sometimes called essential or benign hypertension, a disease of unknown ætiology which was first differentiated from Bright's disease by Allbutt, and called by him hyperpiesia.

3. *Malignant hypertension*, about which I shall have something to say later.

Let us begin by considering the first group, renal hypertension. What happens to renal hypertensives ? How long do they live ? Statistics are dull things, so I will refer to them as briefly as possible. In 31 cases of renal hypertension which came to autopsy at the London Hospital, the average age at death was *forty-five*. Renal hypertensives do not make old bones. Why not ? What kills them ? The cause of death in 84 cases which came to autopsy was as follows :—

1. Uræmia (facile princeps) accounted for 49 cases (about 60 %).
2. Cerebral hæmorrhage ,, ,, 18 ,, (,, 20 %).
3. Cardiac failure ,, ,, 7 ,, (,, 8 %).
4. Other causes ,, ,, 10 ,, (,, 12 %).

Thus the common fate of the renal hypertensive is to die in the fifth decade of life. The kidney lesion is the nigger in the woodpile. In two cases out of *three*, the kidney lesion comes to dominate the clinical picture, and the patient dies of renal failure.

Now we come to the second group, the non-renal or essential hypertensives. How long do they live ? In 86 cases of essential hypertension which came to autopsy at the London Hospital, the average age at death was found to be *sixty*, and many of these cases were complicated by *other* life-shortening diseases such as rheumatic endocarditis. What do essential hypertensives die of ? The cause of death in 123 autopsy cases was found to be :—

1. Cardiac failure .. .. 56 cases, that is 45 % (nearly half).
2. Cerebral hæmorrhage .. 33 ,, ,, ,, 27 %
3. Other causes .. .. 34 ,, ,, ,, 28 %

Uræmia, nil.

So much for hospital records. What about cases observed in general practice ? In 20 cases of essential hypertension dying under our care, the average age at death was nearly *seventy*. I have 26 patients who have been under observation for periods varying from fourteen years to two months and whose average age is nearly *sixty-nine*. This series includes a young man of twenty-five in whom the diagnosis is doubtful ; without him, the average age would be *seventy-two*.

Thus, the fate of the non-renal hypertensive is very different from that of the renal. The subject of uncomplicated essential hypertension may reasonably expect to live into the seventh or even the eighth decade. The kidneys, though they share in the arterio-sclerotic process, are not seriously functionally impaired. Death occurs from cardiac failure or cerebral hæmorrhage, and *not from uræmia*.

We therefore have to deal with two morbid conditions which when first seen may be clinically almost identical but in which the prognosis is very different. Obviously the differential diagnosis is worth making. How is it to be done ? Sometimes it is so easy that a policeman, or perhaps a surgeon, can make it. In other cases it is so difficult as to defy even a general *practitioner*. It must be admitted at once that, in doubtful cases, repeated observation at infrequent intervals may be necessary before the diagnosis can be established with anything like certainty. Remember, the blood-chemistry will not help, for by the time that a high blood-urea indicates renal insufficiency the diagnosis of renal hypertension can be made by looking at the patient's face. To wait for a rising blood-urea before making the diagnosis is like waiting for fæcal vomiting before diagnosing acute intestinal obstruction.

Renal or Not ?

When confronted by a hypertensive patient, what are the points that will help us to decide whether he is suffering from renal or non-renal hypertension ? No single one of them is infallible though some are more suggestive than others. Neither condition is rare, though there is no doubt that essential hypertension is far commoner than renal hypertension.

First, the *history*. If there has been an illness in the immediate or remote past suggesting acute glomerulo-nephritis, or other acute infection, such as scarlet fever, which is liable to kidney complications, suspect renal rather than non-renal hypertension. Secondly, the *age-incidence*. Renal hypertension is a disease of young middle-age, say thirty to forty-five. Essential hypertension, so far as we know, is not usually present before the fifth decade. Therefore, in a young subject, say under thirty, be very chary of diagnosing essential hypertension even when no abnormality is found other than a persistently raised blood pressure. Thirdly, the *appearance* of the patient may help. The renal hypertensive is apt to be pale, thin, and lethargic ; the essential hypertensive is apt to be ruddy, often fat, and energetic. Fourthly, as to the *height of the blood pressure*. In renal hypertension, blood pressures, both systolic and diastolic, tend to run higher than in non-renal hypertension. Moreover, in renal hypertension, blood pressures tend to rise as time goes on, whereas the non-renal may be stationary or nearly so for many years. There are, however, plenty of exceptions to this rule.

Cardiac hypertrophy is common to both conditions and is of no importance in differential diagnosis. The same applies to arterio-sclerosis. Arterio-sclerotic changes in the retinal vessels occur in both conditions, and I have never met an ophthalmic surgeon who would commit himself to a differential diagnosis on the retinal picture alone, though there seems to be evidence that multiple flame-shaped hæmorrhages and exudate speak in favour of renal hypertension, and are of sinister prognostic significance. I have no doubt that hæmorrhages do sometimes occur from the arterio-sclerotic retinal vessels of non-renal hypertensives, but often they are solitary and clear up.

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[*] A paper read before the Exeter Medico-Chirurgical Society on April 25th, 1935.

Fifthly, the *urine*. Fixation of the specific gravity at a low level, say 1010, is an important point in favour of renal hypertension. Twenty-four hourly specimens are hard to come by in general practice. The patients are apt to send up all the urine passed in twenty-four hours, which sometimes entails their hiring a cart to convey it to the surgery. A good substitute method is that described by Fishberg.

"About 6 o'clock of the evening before the test, the patient has his usual supper, which should not contain more than at most 200 c.c. of fluid, but in which it is advantageous to have a considerable amount of protein food. After this he neither eats nor drinks anything until the test is over. Before retiring, he empties his bladder; this urine is discarded as is any urine passed by the patient during the night. On wakening in the morning he passes urine which is kept in a separate bottle. He remains in bed and again empties his bladder one hour after awakening. He is then up and about (if able to do so) for an hour and at the end of this time voids into a third bottle. Each of the three bottles should be labelled with the time when the urine was passed. Thus, if the patient awakens at 8 o'clock the three specimens will be passed at 8, 9 and 10 o'clock. The patient has had sixteen hours in which to "concentrate" with little inconvenience. In private practice with morning surgery hours, it is also a convenience that the patient can bring the three specimens to the surgery soon after 10 o'clock. The specific gravity of each of the three specimens is then taken. If kidney function is unimpaired, the specific gravity of at least one of the specimens will exceed 1022, often going as high as 1032. Older individuals often do not concentrate as well as the young. In very severe impairment of renal function the maximum specific gravity is only 1010, and in intermediary cases figures between these extremes are obtained. In patients with true uræmia the maximum is under 1020 and usually much closer to 1010." From "Hypertension and Nephritis" by A. M. Fishberg. London, 1930, p. 51.

Polyuria is, I think, of no great significance. Both renal and non-renal hypertensives may be polyuric at least until renal or cardiac failure develops in the former, or cardiac failure develops in the latter. Albuminuria is fairly constant in renal hypertension and albumin is often present in large amount; it is inconstant and scanty in essential hypertension in the absence of chronic myocardial failure.

The presence of casts is not of much help. Granular casts tend to be more abundant in renal than in non-renal hypertension. Red blood-cells and leucocytes on the other hand, if present in any number, speak for renal hypertension, assuming, of course, that the urinary tract is otherwise healthy, and free from such conditions as pyelitis or renal calculus. To exclude leucorrhœal contamination catheter specimens are advisable in women.

Two Typical Cases

Perhaps I may shortly quote a typical example of each. First a case of renal hypertension.

A tall, puffy, pasty boy of seventeen, had measles followed by broncho-pneumonia in infancy. At the age of nine he had a short febrile illness. A cloud of albumin was found in the urine which was clear within a week. At the age of twelve he was sent home from school with a temperature of 102° F. and an enlarged tender right post-auricular gland. His eyelids were puffy and the urine showed a heavy cloud of albumin, which persisted as a faint haze. At the age of fourteen he had a cold followed by persistent pyrexia, up to about 100° and highest at midday. He had large tonsils, puffy eyelids, and a cloud of albumin. The blood pressure was 150/100. The fundi were normal. The specific gravity of the urine was 1010. Later a trace of blood appeared in the urine. Albuminuria and pyrexia persisted. His tonsils were removed without improving his general condition. Meanwhile his cardiac apex had moved out to the left.

He was investigated in hospital. Blood cultures and agglutination reactions were negative for the typhoid group and *Brucella abortus*. His blood-urea in April, 1932, was 53 mg. per 100 c.cm. and during his stay in hospital he showed renal inadequacy in the urea-concentration test. In November, 1933, the urine had a specific gravity of 1018, contained a heavy cloud of albumin, and microscopically showed leucocytes, red cells, hyaline, granular and leucocytic casts. The blood count showed a slight secondary anæmia. Since then he has persistently shown mild pyrexia. The urine examined on twelve occasions has always contained albumin, varying from a heavy cloud to a 1/12 volume. The specific gravity of twenty-four hourly specimens of urine has varied between 1020 and 1010. The blood pressure is rising steadily, and recently has always been in the region of 165/75.

I think that there is no reasonable doubt that this boy is suffering from chronic glomerulonephritis of the hypertensive type, and that he is doomed to die young, and most probably of uræmia.

Now compare and contrast that case with the following:—

Five years ago an old lady of seventy-four, complained of a blind spot in her right eye which developed quite suddenly and was like a tea-cosy in shape. She was seen by Mr. P. D. Warburton who observed a retinal hæmorrhage in the macular region. Mr. Ransom Pickard saw her about a month later. His report was as follows: "At the right macula there was a circular patch, deep red in colour, with a border of grey pigment. At the edge of this below was a small hæmorrhage. The right fundus showed slight cutting of the retinal veins by their arteries, but was otherwise normal." Except for this blind spot she felt quite well, though she confessed to slight dyspnœa on exertion. There was no œdema, no headache or vertigo, and in fact no other symptom. The urine had a specific gravity of 1011, and there was a haze of albumin. The blood pressure was 220/140. Two years ago she had an attack of abdominal discomfort and flatulence, and also attacks of tightness in the chest at night which made breathing difficult, and lasted for perhaps an hour or two. Her apex-beat was observed to be just outside the nipple line. These symptoms rapidly subsided with rest, and when seen about a month ago at the age of seventy-nine, she said she felt very well. There was no headache, vertigo, or tinnitus. Her hearing was fair. There was slight dyspnœa and palpitation on exertion, but she could hurry upstairs. Her eyesight was now good. The blind spot had cleared up gradually, taking about a year to do so. There was no œdema. Her blood pressure was 200/140. The radial artery was just palpable, and the apex-beat just outside the nipple. She looked extremely well. The urine was normal, the specific gravity being 1020, and microscopically showed nothing except a few oxalate crystals, epithelial cells, and amorphous urates.

Here is a patient with essential hypertension who feels very well at the age of seventy-nine, and who, when she does die, if indeed she ever does, will die of progressive heart failure or cerebral hæmorrhage, *but not of uræmia*.

Does Malignant Hypertension Exist?

Now what is this thing called malignant hypertension? Some competent clinicians, notably Fishberg and Volhard, in America, whilst agreeing that 90 per cent. of essential hypertensives never show impaired renal function, maintain that the remaining 10 per cent. show evidence of renal destruction and die of uræmia. They say that, in these cases of essential hypertension, which behave normally for years or even decades, a malignant phase arises leading to rapid death. They claim to find at autopsy on these cases a necrosis and endarteritis of the renal arterioles which is followed by acutely progressive renal insufficiency. Other clinicians and pathologists disagree. Dr. Dorothy Russell, who can speak with authority on the pathology of Bright's disease, says that these cases of so-called malignant hypertension are merely cases of exceedingly chronic glomerulo-nephritis. She maintains that these vascular lesions in the kidney are part and parcel of Bright's disease, wrought by the same toxin which produces the glomerular changes. She adds that these same vascular lesions may occur in the early stages of Bright's disease before there is any question of hypertension.

Another argument against the existence of malignant hypertension is the difference in age-incidence. Malignant hypertension so-called occurs between the ages of thirty and forty. Essential hypertension arises between forty and sixty. This surely argues against malignant hypertension being a complication of essential hypertension.

Personally I am on the side of the pathologists. I think these cases in which malignant hypertension is said to supervene on essential hypertension are really mistakes in diagnosis, and that the case was really one of chronic glomerulo-nephritis—i.e., renal hypertension—all along. In my humble opinion, if one sees uræmia developing in a case which one has diagnosed as essential hypertension, the best way out is to admit to oneself (if to nobody else) that the original diagnosis was wrong, and not talk about malignant phases in the hope of laughing it off.

Morbid Adventures

It is probably true to say that, once established, essential hypertension seems to be permanent in the majority of cases, though there is evidence to show that hypertension arising during pregnancy and at the menopause sometimes disappears spontaneously.

Another interesting point is the extraordinary stability of the blood-pressure readings, both systolic and diastolic, in the majority of cases, except when the heart is failing. In some of my cases which have been under observation for years, the variations in individual blood pressures are extremely slight. A man whose blood pressure was 190/125 fourteen years ago, had a blood pressure of 185/110 when last seen a few weeks ago. A woman whose blood pressure was 210/115 nine years ago, when examined recently had a blood pressure of 200/115. The height of the blood pressure seems to bear no relation to the severity of the symptoms. A man with a blood pressure of 270/150 suffered no discomfort except for occasional slight headaches, and was able to do heavy manual work for years. Another man with a blood pressure never higher than 185/105 is permanently miserable with tinnitus, vertigo, and headache.

Essential hypertension is often said to be a disease of civilisation. The hardworking, hard-driving, hard-drinking business man is especially prone to it. I can only say that it is extremely common among the peasantry of Devon, some of whom have never hurried in their lives.

Apart from death in the seventh or eighth decade, various other morbid adventures are apt to befall the subject of essential hypertension. *External hæmorrhages* for example are very common, especially epistaxis which has occurred in 11 of my 46 cases, and hæmoptysis which has occurred in 3. Hæmatemesis and melæna from hypertension no doubt occur, but I have not encountered them, though I daresay that hæmorrhage from a gastric ulcer in one case was aggravated by coexisting hypertension. As a rule these patients seem to be rather refreshed by hæmorrhages, as by venesection; though, of course, the effect of hæmorrhage on the permanent level of the blood pressure is negligible. External hæmorrhages are not always, however, to be looked on with complaisance. In one of my cases a severe hæmoptysis immediately preceded death and, in another, severe epistaxis very nearly resulted in death from the hæmorrhage.

Diabetes mellitus is a well-recognised complication of essential hypertension. I have seen it in five cases, three of which have died. The prognosis, however, does not appear to be seriously affected by this complication unless insulin is given, in which case the patient does badly, since arterio-sclerotic vessels cannot stand it. A woman, aged fifty-three, with a blood pressure of 250/150 and chronic myocardial failure developed glycosuria. She was given insulin 10 units twice daily, and died suddenly four months later.

Cerebral hæmorrhages have been the sole or a contributary cause of death in at least 9 of my cases. Non-fatal strokes, probably due to small hæmorrhages, and ranging from complete hemiplegia to slight monoparesis, have occurred in 7 patients—four of these are still alive. One of them, a woman aged fifty-three, had a hemiplegia sixteen years ago, and is now able to get about with no more disability than a slight limp. Her B.P. is 200/115. Another woman, aged eighty-three, suddenly developed a paresis of her right upper limb nine years ago. She is now quite well, except for a slight clumsiness of her right hand. Her B.P. is 200/120. I have seen herpes zoster twice. This may be mere chance or due to small hæmorrhages in spinal vessels which have become sclerosed as a result of prolonged high pressure. Persistent hypertension though an undoubted cause of arterio-sclerosis is by no means the only, nor indeed, the most potent one. The *pipe-stem radial artery* appears to occur rather in what Allbutt called decrescent arterio-sclerosis—i.e., lean old men who have low blood pressures, small pulse pressures, and small atrophic hearts.

Gout has occurred only once in my series. There is no reason to believe that gout and hypertension have anything more in common than a tendency to occur in the same type of person.

Chronic *cholecystitis* and hypertension seem to have more in common. Cholecystitis occurred in 5 of my patients, all of whom have died. Three of these were not considered fit for operation. One died very shortly after operation, and one several years after a successful cholecystectomy. This was the patient already referred to who died suddenly after hæmoptysis. It should be mentioned in passing, that simple hypertension per se is no contra-indication to giving a general anæsthetic.

Mild *general infections* are stood as well by essential hypertensives as by anyone else, but severe infections try them more than they do normal persons. An old woman of seventy-three went fairly well through a lobar pneumonia despite a B.P. of 190/115. Shortly afterwards, however, she developed signs of progressive heart failure. A man, aged forty-nine, with a B.P. of about 260/150 lived almost symptomless and was able to do hard manual work for eight years, but died in twenty-four hours from broncho-pneumonia.

There is no doubt that *cardiac failure*, or cardiac defeat as Allbutt called it, is the commonest cause of death in essential hypertension. Chronic myocardial failure is, or has been, present in at least 15 of my cases. Other cardiac disease accounts for another 7. Angina has occurred in 4, coronary embolus probably in 2, and Stokes-Adams disease in 1.

In conclusion, then, my advice to intending centenarians is, on the whole, to avoid hypertension if you can. If you cannot, choose the non-renal rather than the renal, and you need not despair.

THE HEAD OF OLIVER CROMWELL[1]

Canon Horace Wilkinson is in possession of a head impaled upon a rusted iron spike fixed on a decayed oak pole. This head is reputed to be that of Cromwell, and for a century past has been the subject of keen controversy, but until recent years no single trustworthy measurement of it had been undertaken, nor had any attempt been made to fit it to any of the known portraits of Cromwell. Canon Wilkinson, with much public spirit, gave permission to Prof. Karl Pearson and Mr. G. M. Morant, D.Sc. (1) to retain the head long enough to carry out a comparison with the available busts, masks, and portraits of

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[1] The Portraiture of Oliver Cromwell, with special reference to the Wilkinson Head, by Karl Pearson, F.R.S., and G. M. Morant, D.Sc. Issued by the Biometrika Office, University College, London, and printed at the University Press, Cambridge. 1935. Pp. 116. 36*s*.

Cromwell; and (2) to state freely the conclusions reached as the result of their investigations.

The anatomical studies undertaken have been enriched by a wealth of historical and antiquarian information collected on the subject. Cromwell died at 3 P.M. on Sept. 3rd, 1658, aged 59. There appear to have been an autopsy and an embalmment. The authors suggest that the autopsy may have taken place soon after death from a suspicion of poison, and the embalming on the following day. As the brain was examined and apparently weighed, there can be little doubt that the skull cap was sawn off. At the autopsy the vessels of the brain are said to have been "overcharged," and the weight is said to have been 6¼ lb.—a figure which the authors reject as an exaggeration, the authority for the statement being far from clear.

An attempt was made, apparently with success, to give him the greatest funeral that had been seen in England; its cost was estimated as not more than £80,000. The effigy was adorned with crown, orb, and sceptre. This was probably one of the chief reasons for the subsequent (political) proceedings.

On May 25th, 1660, Charles II. landed in England, and ten days before that the House of Commons ordered that "John Bradshaw deceased, late Sergeant at Law, be one of those that shall by Act of Parliament be attainted of high treason for murthering of the late King's Majesty." The same order was made concerning Oliver Cromwell, Henry Ireton, and Thomas Pride deceased, and on Dec. 6th the House ordered that the bodies be taken out of their graves and drawn on a hurdle to Tyburn where they were to be hanged and then buried under the gallows. On Dec. 8th the Lords amended the order in the sense that the bodies should be hanged up in their coffins before burial. This "post-mortem" execution was carried out on Jan. 30th, 1661, the anniversary of the execution of Charles I. The sergeant-at-arms appears to have disregarded the order of the Lords and to have permitted the executioner to remove the bodies from their coffins for the hanging. Cromwell's body was encased in six layers of green cerecloth which made the task of the executioner who had to remove the head very difficult; according to an eye-witness he had to make eight cuts before he got the head off. The bodies were tumbled together into a pit already prepared beneath the scaffold; the heads were removed and placed over the south end of Westminster Hall, where Pepys saw them on Feb. 5th.

Applying this and other information to the Wilkinson head Karl Pearson and Morant show that it possesses a number of peculiar characteristics that go far towards establishing it as the genuine head of Cromwell. In the first place the head shows the circular saw cut made at the autopsy in order to remove the brain. Secondly, the head had been embalmed before decapitation, and had been cut off in the crudest possible manner: the first blows with the axe missed the vertebral column and later blows several centimetres further down left four vertebræ attached to the skull. The colour of the hair on the skull agrees with that of Cromwell's hair. The place where his celebrated wart was can still be seen and, lastly, careful anatomical measurements of the skull are compatible with those of the death mask and portraits of Cromwell. The authors found that a skiagram of the Wilkinson head showed the presence of a number of whitish spots chiefly on the frontals and parietals and sought the opinion of Sir Arthur Keith without informing him of the possible identity of the head. Sir Arthur expressed the view that they were Pacchionian depressions and added that: "It should be the skull of an oldish person and the bone formation is not normal. The condition is one of those classed as osteophoresis. I have seen the condition in the skulls of the insane." The authors add that in their opinion Cromwell was certainly not insane, but did suffer from a religious monomania.

The beautiful reproductions of the various portraits and miniatures of Cromwell greatly enhance the value of this book. Now that the identity of the skull is practically certain, might it not be reinterred—e.g., beneath Cromwell's statue outside Westminster Hall?

SOCIAL HYGIENE

THE value of the work done by the British Social Hygiene Council has lately been brought before our readers both by an appeal (March 23rd, pp. 688 and 702) and by reports of the proceedings of the seventh Imperial congress, held last month in London. The need for sympathy and support is again made clear by the annual report.

The year saw the first appearance of the Empire Social Hygiene Year Book (reviewed in our columns in September), which includes, besides particulars of the health services and vital statistics of the Empire, a careful survey of the problems of marriage, child welfare, delinquency, venereal diseases, tuberculosis, mental disorder and allied problems throughout the world, and also offers a number of essays on such subjects as biological studies in the universities and training colleges of the Empire, juvenile delinquency in the Dominions and Colonies, international aspects of the film, the social work of the League of Nations, and a study in comparative legislation. A second volume of this useful work of reference has now been published.

The report itself particularly emphasises the need of determined efforts to prevent inherited disease, and stresses the importance of the labours of almoners and trained social workers, who are, unfortunately, as yet available in less than a quarter of the treatment centres. Among the many subjects which have engaged the activities of the Council during the year are the welfare of members of the mercantile marine, sex delinquency in girls and general delinquency in boys, and the increase in tuberculosis and venereal disease in Bechuanaland. The sub-committee which has prepared a memorandum on marriage recommends special preparation for those about to be married, including instruction in the physiology and psychology of the married state. Voluntary submission to medical examination before marriage is also advocated. Since the only way of reaching those intending marriage is through ministers of religion and registrars, the coöperation of those people is essential, and the council proposes to call a conference and put the problem before them. The council is also using its influence to promote the appointment of trained married men and women probation officers to handle separation cases and conciliation proceedings in connexion with the courts. The medical advisory board is considering the whole question of securing the help of medical psychologists for magistrates.

NEW PREPARATIONS

OSTOCALCIUM TABLETS.—The conditions that are now recognised to call for the exhibition of calcium are receiving wide attention, directed especially towards the provision of salts of calcium in a readily assimilable form. The tablets, manufactured by Glaxo Laboratories, (56, Osnaburgh-street, London, N.W.), each contain grs. 7½ of calcium sodium lactate in combination with 500 international units of Ostelin vitamin D (Calciferol G.L.). The advantages claimed for the double calcium salt are that it is more palatable than other salts of calcium, and that the addition of calciferol renders assimilation more simple. The tablets are recommended for use in all conditions to which calcium prophylaxis is applicable as in allergic disorders, or to compensate for undue calcium drain. The Glaxo Laboratories have also added to their preparations CALCIUM LEVULINATE, which in the forms of 10 and 15 per cent. sterile aqueous solution of the calcium salt of levulinic acid, has been found useful for administration by injection.

ERGOMETRINE. (Allen and Hanburys Ltd., London, E.2, and British Drug Houses Ltd., London, N.1).—The isolation of ergometrine, an alkaloid of ergot, was described in the *British Medical Journal* of March 16th last, by Mr. H. W. Dudley, F.R.S., and Dr. J. Chassar Moir. Other references to the remarkable drug have appeared in medical literature, indicating that ergometrine may establish a claim to be an active principle of great practical importance, appearing indeed to have the action for which ergot was originally introduced into obstetrical and gynæcological practice. Ergometrine prepared in the laboratories of Messrs. Allen and Hanburys has been found to exhibit the characteristic effects of the crude drug, it is indicated therefore in all cases where ordinary ergot is indicated but might have the disadvantage of nauseating the patient. Messrs. Allen and Hanburys supply a sterilised solution in double ended ampoules, to meet employment by injection or by mouth.

The British Drug Houses have placed on the market ergometrine in tablet form for oral administration and samples are available for practitioners.

Appointments

DAVISON, GEORGE, M.D. Durh., has been appointed Medical Registrar at the Royal Victoria Infirmary, Newcastle-upon-Tyne.

KELLETT, C. E., M.D. Camb., M.R.C.P. Lond., Medical Registrar at the Royal Victoria Infirmary, Newcastle-upon-Tyne.

OSBORNE, R. P., M.B. Manch., F.R.C.S. Eng., Resident Surgical Officer at Park Hospital, Davyhulme, Manchester.

PHILIP, J. F., M.B. Aberd., Senior Resident Officer at Aberdeen Royal Infirmary.

Certifying Surgeon under the Factory and Workshop Acts: Dr. H. G. YOUNG (Hatfield, Hertford); Dr. R. A. F. CREET (Ripley, Surrey); and Dr. D. L. FREW (Greenlaw, Berwick).

London County Council Hospital Staff.—The following appointments, promotions and A.M.O. (I.) and (II.) and assistant . and II.:

CRAWFORD, D. K., F.R.C.S. Edin., St. Mary, Islington (has since resigned);

BEATTIE, D. A., F.R.C.S. Eng., A.M.O. (I.), Fulham;

MACKENZIE, E. F., M.B. Sydney, A.M.O. (II.), St. James'.

SINGER, J. P., B.A. Camb., M.R.C.S. Eng., A.M.O. (II.), St. George-in-the-East.

ROBINSON, M. H. B., M.B. Melb., F.R.C.S. Eng., Senior A.M.O. (II.), St. Charles';

GISSANE, W. C., M.B. Sydney, F.R.C.S. Eng., Senior A.M.O. (II.), St. James';

DEVIN, C. H., M.R.C.S. Eng., A.M.O. (I.), St. Luke's, Chelsea;

SMITH, D. W. G., M.B. Edin., A.M.O. (I.), St. Giles';

WILKIE, D., M.D., F.R.C.S. Edin., Senior A.M.O. (II.), St. Pancras.

Vacancies

For further information refer to the advertisement columns

Aberdeen University.—Lecturer in Morbid Anatomy in Dept. of Pathology. £400.

Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. At rate of £150.

Barnsley County Borough.—M.O.H., &c. £900.

Bath, Royal United Hospital.—H.S. and H.P. Each at rate of £150.

Birmingham, Ear and Throat Hospital.—Third H. S. At rate of £150.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Res. M.O. £300.

Birmingham United Hospital.—First Asst. for Neurological Dept. £200.

Birmingham and Midland Eye Hospital.—H.S. At rate of £130.

Bolton Royal Infirmary.—Res. Surg. O., also Asst. Res. Surg. O. £250 and £200 respectively.

Bradford, Grassington Sanatorium.—Asst. Res. M.O. £175.

Bradford Royal Eye and Ear Hospital.—H.S. £160.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.

Brighton, Sussex Eye Hospital.—Hon. Clin. Asst.

Cardiff, King Edward VII. Welsh National Memorial Association.—Half-time Asst. Tuber. O.'s. Each £250.

Cardiff, *South Wales, &c.*—Asst. Lecturer in 400.

Chelms —H.P. At rate of £150.

City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H.P. At rate of £100.

Croydon Mental Hospital, Upper Warlingham, Surrey.—Sen. Asst. M.O. £600.

Dewsbury and District General Infirmary.—Sen. H.S. £200.

Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts. £175.

Durham County and Sunderland Eye Infirmary.—H.S. £350.

Fareham, Hants, Knowle Mental Hospital.—Jun. Asst. M.O. £350.

Glasgow, Lightburn Joint Hospital, Shettleston.—Res. Physician. £350.

Greenwich Metropolitan Borough.—Jun. Asst. Maternity and Child Welfare M.O. £500.

Hove General Hospital, Sussex.—Res. M.O. At rate of £150.

Huddersfield, Storthes Hall Mental Hospital, Kirkburton.—Fifth Asst. M.O. £350.

Hull Royal Infirmary.—Third H.S. At rate of £150.

At rate of £125.

At rate of £130.

Deputy Med. Supt. £700.

Liverpool, Alder Hey Hospital.—Res. Asst. M.O. £200.

Liverpool Heart Hospital.—H.P. At rate of £100.

London Homœopathic Hospital, Great Ormond-street, W.C.—Gynæcological H.S. At rate of £100.

Macclesfield General Infirmary.—Second H.S. £150.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res. M.O. At rate of £125.

Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

Middlesbrough, North Riding Infirmary.—Third H.S. £125.

Middlesex Education Committee.—Teacher in Anatomy 2 gns.

reenwich-road, S.E.—2 Cas. O.'s. Each and H.S. Each at rate of £100.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. or H.S. At rate of £100.

Northampton General Hospital.—H.S. At rate of £150.

Northumberland C.C.—Asst. County M.O.H. £500.

Norwich, Norfolk and Norwich Hospital.—Cas. O. £120.

Nottingham General Hospital.—H.S. to Ear, Nose, and Throat Dept. Also Casualty Officer. Each at rate of £150.

Plymouth, City General Hospital.—Asst. M.O. Also Jun. Asst. M.O. £300 and £250 respectively.

Plymouth, Prince of Wales's Hospital.—H.P. At rate of £120.

Portsmouth Royal Hospital.—H.P. At rate of £130.

Post Office (Western District).—Medical Officer. £500.

Preston and County of Lancaster Royal Infirmary.—H.S. £150.

Hospital for Children, St. Quintin- .—H.S. At rate of £100.

Battle Hospital.—Res. Asst. M.O. £300.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Rotherham Hospital.—Cas. H.S. £150.

Royal Chest Hospital, City-road, E.C.—Med. Reg. £50.

Pall Mall East, S.W.—Milroy Lect.

.C.—Dental H.S. At rate of £80.

—Asst. M.O.H. £500.

es of the Genito-Urinary Organs, &c.

Second Asst. Cas. O. At rate of £80.

Shrewsbury, Royal Salop Infirmary.—Two Res. H.S.'s. Each at rate of £160.

Southampton Free Eye Hospital.—Locum Tenens Ophth. H.S. £6 6s. weekly.

South-Eastern Hospital for Children, Sydenham, S.E.—Two Res. M.O.'s. Each at rate of £100. Also Hon. Pathologist. £50.

Taunton and Somerset Hospital.—H.P. and H.S. Each at rate of £100.

Torquay, Torbay Hospital.—Hon. Surgeon.

University of Lc Pathology. £300. Also \ £200.

Ventnor, Isle of W *Consumption, &c.*—Jun. Asst. Res. M.O.

Warwick, King Edward VII. Memorial Sanatorium, Hertford Hill.—Jun. Asst. M.O. At rate of £200.

Wimbledon Hospital, Thurstan-road, S.W.—Res. M.O. At rate of £150.

Wolverhampton, Prestwood Sanatorium.—Asst. Res. M.O £400.

Wolverhampton, Royal Hospital.—H.S. for Fracture and Orthopædic Dept. At rate of £100.

Woolwich and District War Memorial Hospital Shooter's hill, S.E.—Res. M.O. £175.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Troon (Ayrshire), Rothes (Morayshire), Caerleon (Monmouthshire), and Milborne Port (Somerset).

Births, Marriages, and Deaths

BIRTHS

BROWN.—*On July 27th, at Selkirk, the wife of John Scott Brown, M.B. Edin., Uganda Medical Service, of a son.*

LAW.—*On July 30th, at Devonshire-place, the wife of Frank W. Law, F.R.C.S. Eng., of a daughter.*

SMITH.—*On July 28th, at Eton-villas, N.W., the wife of K. Shirley Smith, F.R.C.P. Lond., of a son.*

TINCKER.—*On July 30th, at Painswick, the wife of Surg. Lt.-Comdr. R. W. Holden Tincker, M.R.C.S. Eng., R.N.V.R., of a daughter.*

MARRIAGES

WINTER—RICHARDSON.—*On July 31st, at Newcastle, Lewis Bland Winter, M.D. Camb., Ipswich, to Ella, only daughter of Mr. J. G. Richardson, of Newcastle-on-Tyne.*

DEATHS

BIGGS.—*On July 28th, M. G. Biggs, M.D. Durh., of Rottingdean Heights, aged 86.*

FARIE.—*On August 5th, at Wimbledon Hill, S.W.19, Gilbert John Farie, M.C., M.B. Edin., in his 54th year.*

MCCALDIN.—*On August 3rd, at Wymeswold, Cecil McCaldin, F.R.C.S. Edin., of Nottingham.*

NASH.—*On August 2nd, suddenly, at Bedford, Walter Gifford Nash, F.R.C.S. Eng., aged 72.*

NEVILLE.—*On July 3* after a long illness, Thomas Neville,

RICE.—*On July 31st,* Norwich, David Rice, M.D. Brux., M.R.C.S. Eng., aged 64.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

THE MORBID ANATOMY OF CARIES OF THE THORACIC SPINE IN RELATION TO TREATMENT*

BY H. J. SEDDON, M.B. Lond., F.R.C.S. Eng.

RESIDENT SURGEON, COUNTRY BRANCH OF ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, STANMORE, MIDDLESEX

A CONSIDERATION of the treatment of spinal caries must still be based on a clear understanding of the morbid anatomy of the disease. As yet, no specific remedy has been discovered for the treatment of tuberculosis and the proven value of rest and open-air treatment in the cure of joint lesions has not abolished the need for rational mechanical treatment, founded on anatomical and physiological principles.

The morbid anatomy of caries of the thoracic spine is so wide a subject that I propose to refer only to certain aspects of the disease that have received little or no attention in the past. Spastic paraplegia, the most important complication of thoracic caries, has been dealt with recently by Butler and myself[1] and I shall not make more than a passing reference to this condition.

Anatomical Types of Spinal Caries

1. True *tuberculous arthritis* as found in the diarthrodial joints of the extremities, though occasionally seen in the spine, is relatively unimportant. It occurs most commonly in the occipito-atlanto-axial group of joints, and as a secondary condition in the posterior articulations of the cervical, thoracic, and lumbar vertebræ. So far as is known it never occurs as a primary lesion in these small joints.

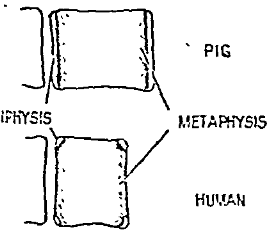

FIG. 1.—Diagram showing vertebral epiphyses of man and pig.

2. *So-called tuberculous epiphysitis* of a vertebral body is a well-known condition, and extremely common in the thoracic and lumbar regions. Strictly speaking, it is not an epiphysitis but rather a metaphysitis. In the typical vertebra of most young mammals the vertebral body is exactly like a long bone. There is a short shaft and two epiphyses. A few years ago the madder feeding experiments of John Hunter were repeated by Prof. J. C. Brash, who has been particularly interested in working out the growth of the mandible.[2] He has allowed me to examine the spines from several of his pigs that were fed on madder from an early age until a few weeks before death. The bones show clearly that all the longitudinal growth in the vertebral body takes place at the metaphyseal regions of the shaft exactly as in a long bone and that the epiphysis contributes little or nothing to the increase in length. In the human vertebra the epiphysis is reduced to an insignificant ring appearing at about the 12th year, and fusing at about the 24th. It contributes nothing to the growth in length, and it never appears to be the primary focus for tuberculosis of the spine (Fig. 1). The lesion is found on the upper or lower surface of the body and is therefore metaphyseal; for this reason the term epiphyseal tuberculosis should be discarded.

An interesting growth phenomenon connected with the metaphyses must also be mentioned. It is sometimes seen in the later stages of spinal caries in children. It has long been known that a prolonged increase of the blood-supply in the neighbourhood of an epiphysis may lead to increased activity of the growth centre. Excessive growth at the lower end of the femur in chronic osteomyelitis of the shaft and in protracted tuberculosis of the knee is familiar to all of us (Fig. 2). A few years ago J. G. Johnstone[3] pointed out that an overgrowth phenomenon may sometimes be observed in spinal caries, though he gave no explanation of the condition. In the cases he reported the rate of bone production in the surviving growth centres of diseased vertebræ was about twice as great as that in the normal vertebræ above and below the lesion. This must be due to long-continued hyperæmia of the growth discs immediately adjoining the lesion (Fig. 3).

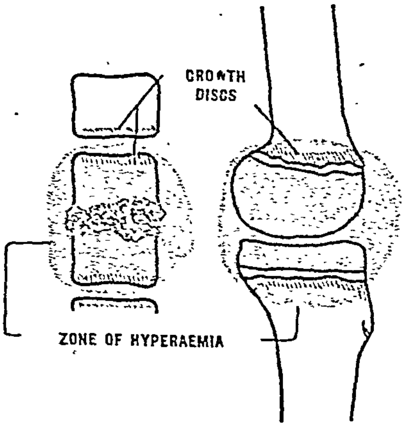

FIG. 2.—Diagram showing how a zone of hyperæmia due to chronic infection may influence adjacent growth-discs.

The earliest X ray sign of metaphyseal tuberculosis is narrowing of the joint space, due to simultaneous involvement of two adjoining metaphyses, and collapse of the intervening disc from interference with its nutrition.

Leriche[4] has stated that the narrowing of the joint space is due to compression of the disc brought about by spasm of the muscles around the lesion. This is hard to believe. The turgidity of the normal disc is so great that it cannot be compressed even by violent flexion of the spine; the vertebral body is crushed before the disc will yield. How could any muscles, however powerful, keep up the terrific force necessary to compress a disc for weeks on end? There is ample anatomical evidence to show that the disc is actually destroyed though not directly by the disease (Fig. 4).

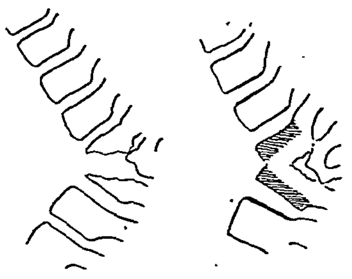

FIG. 3.—Tracings from strictly comparable radiograms of a child's spine showing (on the right) the new bone (shaded) laid down during the course of two years. There has been remarkable activity at the two growth, discs adjoining the tuberculous focus.

At this stage, no destruction of bone may be demonstrable radiographically, nevertheless the primary focus is not in the disc but in the bone.

3. A *diffuse osteomyelitis* is also common. In the early stages it is sometimes apparent in the radiogram

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* Hunterian lecture delivered before the Royal College of Surgeons of England, 1935.

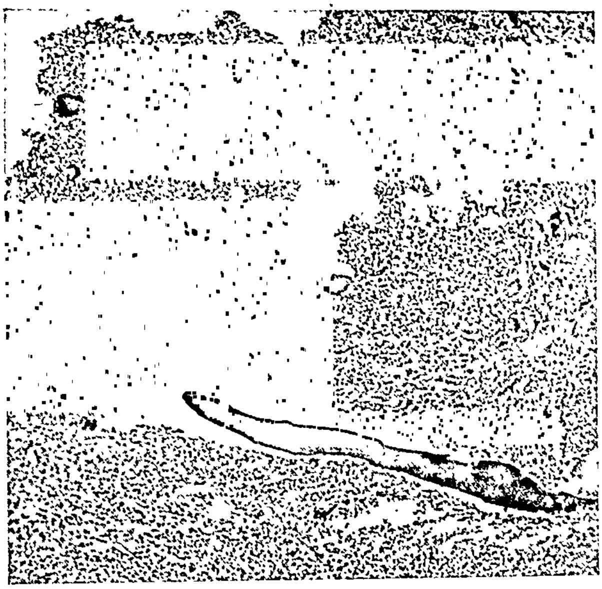

FIG. 4.—Microphotograph of a very early metaphyseal lesion. Tuberculous granulation tissue with giant cells on both sides of an intervertebral disc which is melting away, but shows no signs of actual disease.

as an increase in density of the vertebral body, which is of value in diagnosis. In two cases where secondary foci were suspected in a known tuberculous spine, a diffuse increase in density of two or three vertebral bodies enabled one to localise the new focus. A similar appearance is sometimes found in metaphyseal lesions. It may represent a miliary necrosis of bone with deposition of lime salts. In some cases massive necrosis follows with wholesale destruction of bone; in other cases a more slowly developing rarefaction appears in the usual way. The danger is to mistake this increased density for a sign of healing.

The osteomyelitic focus may lead to widespread destruction of bone within a single body, which may collapse like a concertina, slowly or suddenly. If the collapse is sudden, some of the inflammatory products may be squirted backwards into the vertebral canal and inflict irreparable damage on the cord.[1]

A less malignant infection leads to cavitation of the vertebral body and sometimes the formation of sequestra.

4. Very occasionally the primary focus may appear on the anterior or, less commonly, the posterior surface of a vertebral body—a *so-called periosteal lesion.* It cannot be diagnosed until erosion of the bodies has occurred or until the cord has been compressed—if the disease has commenced under the posterior common ligament.

The spread of a thoracic abscess upwards or downwards causing elevation of the anterior common ligament and erosion of the anterior surfaces of the vertebral bodies adjoining the primary focus is thought by some to be a secondary periosteal lesion (Fig. 5 A). Ghormley and Bradley [5] have pointed out that a collection of pus, tightly compressed between the anterior surfaces of vertebral bodies and the anterior common ligament, may well transmit the pulsations of the aorta to the bone in much the same way as the sac of an aneurysm, and that the erosion so frequently found in tuberculosis is therefore probably of mechanical origin. Four points may be advanced in favour of this suggestion:—

(*a*) The intervertebral discs are often spared, though not to the same degree as in true aneurysm.

(*b*) The aneurysm-like erosion is never found above the arch of the aorta, although anterior abscesses are not infrequent above this level.

(*c*) When an abscess spreads longitudinally under the posterior common ligament such bony involvement as does occur is never of the type found anteriorly—that is, uniform cupped excavation of each vertebral body.

(*d*) In two recent specimens that I have been able to examine there was no tuberculous disease of the eroded vertebræ.

The condition is easily recognised radiographically and it is well to look for it seeing that true involvement of a body may develop anywhere along the course of the abscess. In a number of specimens I have found that the infection has broken in at a higher level—a true secondary focus has formed (Fig. 5 B).

Having defined the four general types of spinal caries; the diarthrodial joint infection, the epiphyseal or rather metaphyseal lesion, infection of the cancellous bone (osteomyelitis), and lastly periostitis, we may now consider the chief forms of the disease as it affects the thoracic spine.

The Typical Lesion

The typical thoracic lesion commences either as an osteomyelitis or a metaphysitis of one or more vertebræ. The tendency to extensive spread of the disease is far greater than in the cervical or lumbar regions, and the reason for this is to be found in the peculiarities of the thoracic spine. In the first place, the thoracic spine is subject to constant respiratory movement much of which takes place between the diseased vertebræ, a point that can easily be verified during the performance of a costo-transversectomy. Many years ago Ménard [6] pointed out that bone destruction in tuberculosis is the result either of *tuberculous ulceration* or *mechanical ulceration,* or both. Tuberculous ulceration is due solely to the activity of

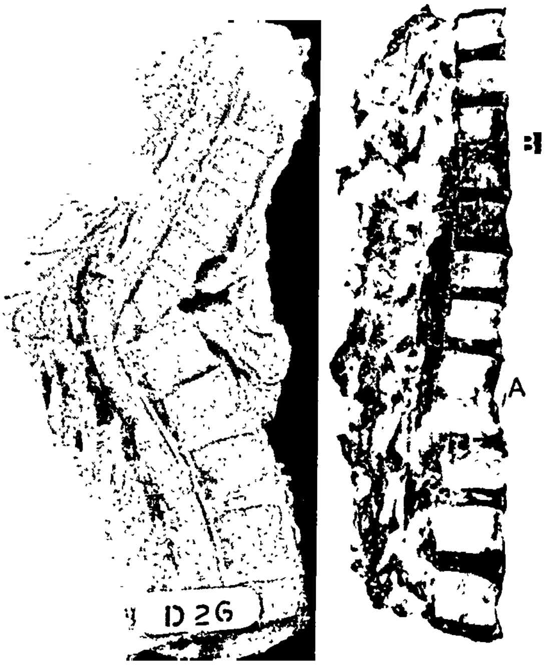

FIG. 5.—On the left is an excellent example of aneurysm-like erosion of several vertebral bodies. (Middlesex Hospital Museum.) I am indebted to Prof. James McIntosh for permission to reproduce this photograph. In the photograph on the right A is the primary focus. A large fusiform abscess has gradually spread upwards and led to anterior erosion of seven vertebræ and the development of a secondary focus at B. The progress of the condition was followed radiographically.

the disease: mechanical ulceration is the result of movement—friction between inflamed and softened joint surfaces. The thoracic movement in a case of caries leads to mechanical ulceration equalled in severity only by that found in neglected hip disease. The natural thoracic kyphosis also encourages this process. Another factor tending to produce widespread destruction is the close confinement of a thoracic abscess by the strong anterior common ligament and its lateral expansions. In the cervical or lumbar regions, abscesses track away from the spine with the greatest ease. This is rare in the thoracic region, and the extension of a fusiform thoracic abscess may lead to aneurysm-like erosion of many vertebræ and the development of secondary foci above or below the original lesion (Fig. 6 A and B). Where the erosion is purely of the aneurysm type no great damage is done, but the appearance of secondary foci is a serious matter.

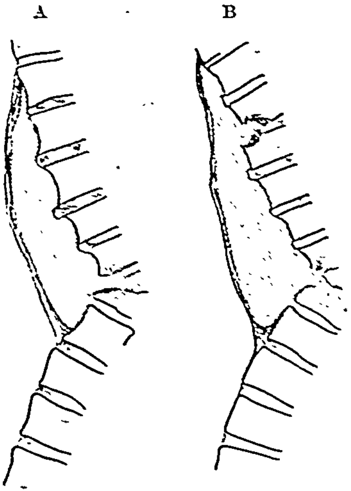

FIG. 6.—The drawing on the left is traced from a radiogram showing an aneurysm-like erosion of four vertebræ above a typical thoracic focus. That on the right shows a similar erosion with a secondary lesion at the upper limit of the abscess cavity. It made its appearance 2¼ years after the primary focus was detected.

With further local spread of the disease certain other conditions may arise, concertina collapse and sequestrum formation (to which reference has already been made), and lastly pathological dislocation of the spine. The importance of these three conditions is that they may give rise to severe and often fatal paraplegia.[1]

The evil effects of widespread bone destruction in the thoracic spine are sufficiently grave during the active stage of the disease, but if the patient escapes all these evils his troubles may not be over. Even when the lesion is quiescent or apparently healed further complications may develop.

The Late Complications of Extensive Thoracic Disease

When a number of vertebræ have been destroyed angulation of the spine invariably occurs; the process often begins during the active stage of the disease and may continue for years after the lesion has healed, while the patient is leading a more or less normal life. No form of external support will arrest this bending, and a bone-graft, at least in children, is equally ineffective.

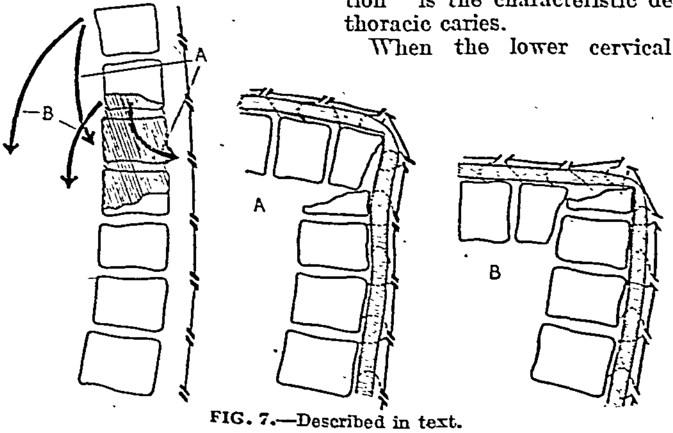

FIG. 7.—Described in text.

If the lesion is not extensive such small gaps as exist during the active stage of the disease are closed ultimately by the apposition of the surfaces of the involved vertebræ. When, however, a number of vertebral bodies have been completely destroyed, the segment of the spine above the lesion swings down through a quadrantal path in such a way that the lower surface of the vertebra above the gap cannot possibly come into contact with the upper surface of the vertebra below. The spinous processes, laminæ, pedicles, and articular processes of the vertebræ that have lost their bodies are responsible for this mechanism. For the sake of simplicity the loss of bone has been represented in the diagrams as confined to three vertebræ (Fig. 7). In actual fact the average number of bodies lost before any of these changes takes place is six. The segment of the spine above the lesion may travel in one of two directions: it may swing posteriorly over the upper surface of the vertebra below the gap (A), or slide down along the anterior face of the lower segment of the spine (B). Let us consider the latter first.

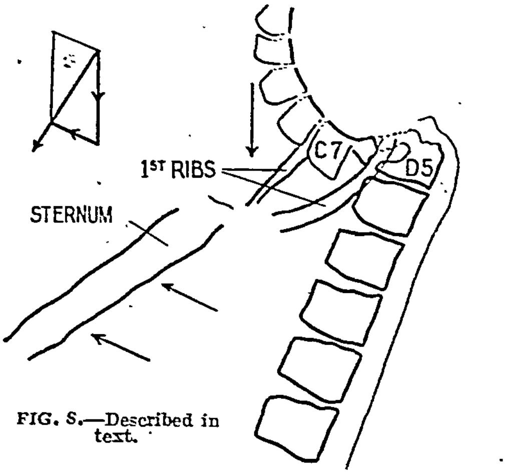

FIG. 8.—Described in text.

ANTERIOR LUXATION OF THE UPPER SEGMENT OF THE SPINE

In all cases where this condition was demonstrated the lesion was situated above the level of the sixth thoracic vertebra. It appears that "anterior luxation" is the characteristic deformity in severe high thoracic caries.

When the lower cervical and upper thoracic vertebræ have been destroyed, the cervical spine has no choice but to luxate anteriorly; it behaves in much the same way as the lumbar spine in spondylolisthesis, the only difference being that in the former the neural arches of the destroyed vertebræ are interposed and compel the cervical column to make its descent with ever-increasing angulation. If the lesion is a little lower —i.e., centred in the upper thoracic spine—an additional factor must be considered. During inspiration in the normal subject the upper end of the sternum moves very little on account of its firm anchorage to the vertebral column by the short immobile first ribs. If there is a solution of continuity in the upper thoracic spine and the first ribs are attached above the gap, it is possible for the whole sternum to be carried forward during inspiration (Fig. 8); its posterior anchorage is lost and through its attachment to the first ribs it can drag forward the segment of the spine above the lesion. It is clear from the diagram that the interaction of this force and gravity produces the characteristic deformity. Once this state of affairs has arisen, the deformity is likely to progress. The upper and lower segments of the spine can never come into adequate contact, consequently bony fusion cannot occur; indeed, there is often a gap between the two, filled only with fibrous tissue. Spontaneous bony fusion of the posterior elements occurs at the apex of the kyphos, but even if it were supplemented by extensive bone grafting, it is difficult to see how the strongest posterior fusion could support almost the whole of the weight of the head and neck.

POSTERIOR LUXATION

The deformity found in extensive lesions of the lower thoracic region is posterior luxation of the upper segment of the spine.

During inspiration in the normal subject the ribs and sternum are elevated, the antero-posterior and transverse diameters of the thorax are increased. Without describing the mechanism of respiration in detail it must be evident that it is only the relative rigidity of the vertebral column that prevents it from sharing in this otherwise symmetrical expansion of the thorax. If there is a gross defect in the thoracic spine there is no reason why the inspiratory force should not carry back the spine above the lesion in the same way that it carries the sternum forward (Fig. 9). The resultant of this force *In* with gravity *G* follows approximately the same path as that taken by the spine in "posterior luxation," and it is not unreasonable to suppose that this resultant force is the one producing the deformity. Whatever may be the exact cause of "posterior luxation" the frequency with which it occurs after extensive tuberculous lesions in the lower thoracic spine is in no doubt.

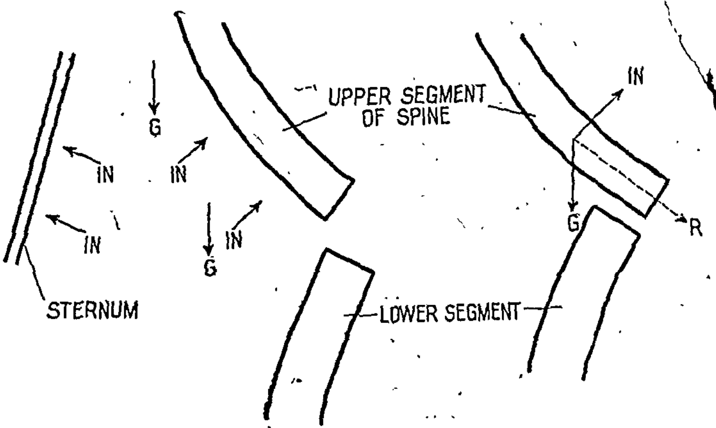

FIG. 9.—Described in text.

The prognosis as regards deformity is better in posterior luxation than in anterior luxation. There is no reason why bony fusion should not take place seeing that good contact between broad bony surfaces is generally present, and solid fusion is often found in spines showing posterior luxation.

Almost everyone has seen patients with severe deformity who lead active and useful lives—suffering, apparently, no inconvenience from marked anatomical changes in the spine and chest. Nevertheless certain serious conditions may arise in cases of gross deformity following thoracic caries.

1. A general lack of development is noticeable in many cases where the disease commenced early in life. In addition to the shortening resulting from the deformity of the spine, there is a definite general dwarfism.
2. There is a diminished resistance to chest infections, and an apparently trivial bronchitis may lead to death at an early age.
3. The cardiac efficiency is sometimes impaired and Carey Coombs has drawn attention to the association of severe kyphosis with sudden fatal cardiac failure.[7]
4. Intractable backache inevitably develops sooner or later in the movable segments of the spine, generally those below the lesion.
5. Lastly, a paraplegia of late onset, developing even 30 or 40 years after the active disease, is not uncommon in patients with severe deformity. In a series of 186 cases of Pott's paraplegia, Butler and I found that half of the cases fell into this group.[1] It is due either to reactivation of a small focus of disease in the spinal canal, or, less commonly, to involvement of the cord by bone. The important point is that late onset paraplegia is rarely found except in cases with gross deformity.

It must now be evident that, apart from the question of the patient's appearance, there is a strong case for every effort being made to reduce bone destruction during the active stage of caries of the thoracic spine.

Treatment

I propose to limit my remarks almost entirely to one form of conservative treatment—namely, rest in hyperextension. It appears to offer certain benefits not conferred by any other type of treatment, and as its value is by no means generally appreciated a revival of interest in this form of treatment is definitely called for.

The value of rest in the treatment of tuberculosis of joints, and particularly the spine, has slowly gained universal recognition since the days of Jean Pierre David. It is only in the methods employed for securing this end that differences are found between one school of surgeons and another. However, rest in hyperextension is a very definite departure from the beaten track, and it is necessary for us to inquire into the origin of this form of treatment.

Hyperextension of the spine in the treatment of Pott's disease first came into prominence towards the end of the last century when Calot introduced his operation of "redressement brusque"—forcible straightening of the deformed spine under anæsthesia. He did not advocate this operation as a form of treatment for the active disease, but rather as a means for correcting the deformity. Calot still believed in the value of rest, though probably not with the fervour that characterised David, Hilton, Hugh Owen Thomas, or Robert Jones. His aim was to hyperextend the spine to such an extent that the line of gravity would fall through the pedicles at the level of the lesion, thus producing stability even though a number of vertebral bodies were absent. We now know that this is impossible, at least in the thoracic region, and his successes must have been due to the production of good compensatory curves above and below the lesion. Calot reported some encouraging results, and such was his enthusiasm that surgeons all over Europe began to practise his operation.

Then came news of disasters following forcible correction of the deformed spine—sudden death, permanent paraplegia, and recrudescence of the disease being the most serious. Calot finally recognised that his operation, like most others, had its limitations, and he was compelled to modify his original technique to the point of "une douceur extrême." After enjoying a few years of extraordinary popularity "redressement brusque" ended its days in neglect and disrepute, but it led nevertheless to the recognition of a new and valuable principle in the treatment of spinal caries.

Following Calot, Goldthwait, Tunstall Taylor, and many others practised hyperextension in modified forms until finally a new conception of treatment by rest developed: why not nurse the early active case in hyperextension from the first, so that deformity with all its attendant evils could never develop? This was the beginning of the various forms of hyperextension apparatus in use to-day—the frames associated with the names of Bradford, Whitman, and Silver, and the ingenious appliances devised by Gauvain.

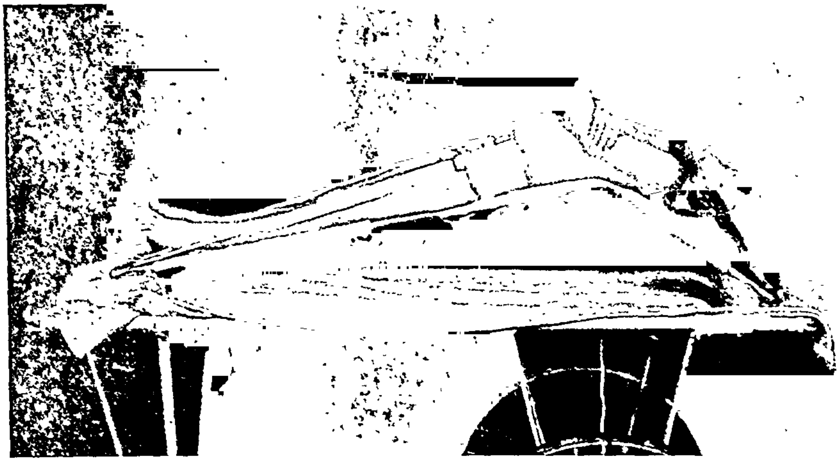

FIG. 10.—The Stanmore frame. The angulation is made exactly opposite the lesion. The pelvic band and head sling prevent longitudinal movement. The frame is no broader than the patient's trunk, and lateral movements are impossible. Almost the whole body surface is available for insolation.

Attractive as this may seem it is, however, a sad fact that a case of thoracic caries diagnosed early and treated from the first by hyperextension may lose several vertebral bodies. A gap in the spine is created, though it may only be demonstrable radiographically. It was the ambition of most of the early advocates of hyperextension to maintain the normal alignment of the spine even though several vertebral bodies might have disappeared during the course of the disease. They hoped to accomplish this during the healing or ambulatory stage by the application of a suitable jacket.

They had fallen into the same fundamental error as Calot, and this mistaken idea is responsible for the strong antagonism to treatment in hyperextension that is found in many quarters to-day. Pott believed that apposition and finally bony fusion of the involved vertebræ was the natural process of healing in spinal caries, and all our experience of tuberculosis of joints goes to confirm his view. Firm ankylosis, preferably bony, is, to use Pott's words, "the thing aimed at." Rest in hyperextension with any other end in view is entirely wrong.

However, rest in hyperextension may be assigned a most valuable place in the treatment of spinal caries on strictly orthodox lines, and I hope to show that it possesses certain merits not found in any other form of treatment.

Let us turn for a moment to the treatment of tuberculosis of the hip. In hip disease, as in spinal caries, bone destruction is the result of the activity of the disease, and of mechanical attrition of inflamed and softened bone brought about by the combined action of muscle spasm, movement, and weight-bearing. Tuberculous ulceration and mechanical ulceration of bone, to borrow Ménard's terms, are present in tuberculous disease of the hip and spine alike.

In the hip, mechanical ulceration can be almost entirely eliminated by combined traction and immobilisation, and Pugh has demonstrated very clearly that strong traction even in the absence of thorough immobilisation reduces bone destruction very considerably.

It is clear that immobilisation combined with powerful traction would be of the greatest possible value in the treatment of caries of the thoracic spine where bone destruction is often so extensive. Fixation does not present great difficulties, but powerful longitudinal traction for any length of time is out of the question. Yet the same effect may be obtained without difficulty, by hyperextension of the spine, provided that constant pressure is applied at the level of the lesion. We must aim at nothing less than the maintenance of a definite gap between the diseased surfaces; only in this way can the constant respiratory grinding be prevented from producing mechanical destruction of the vertebral bodies. That it is possible to produce such a gap is evident from radiograms.

ADVANTAGES OF REST IN HYPEREXTENSION

The peculiar virtues of rest in hyperextension are as follows:—

1. Bone destruction is reduced to a minimum; such destruction as does occur is due solely to the activity of the disease, a factor over which we have only a very limited control. I have been able to compare the bone loss in a number of cases of thoracic caries in children under treatment at the country branch of the Royal National Orthopædic Hospital, one group being treated by hyperextension, the other by simple recumbency. There is no doubt that the average number of vertebræ lost was less in the children treated in hyperextension than in the second series.

It has already been shown that the loss of a number of vertebral bodies results not only in the development of severe deformity of one or other of the types described but that cardiac inefficiency, lowered resistance of the lungs to infection, and late onset paraplegia must all be reckoned among the possible sequelæ of extensive thoracic disease. Treatment in hyperextension is the only measure known which aims directly at diminishing the incidence of these *complications.*

2. The accidents resulting from flexion of the spine during the active stage of the disease may all be prevented if hyperextension is begun early. Three conditions have been described: concertina collapse of a single body, the posterior displacement of sequestra, and pathological dislocation of the spine. It is admitted that these accidents are rare, but they are nevertheless of great importance for they are all capable of producing severe and generally permanent paraplegia.

3. The compensatory overgrowth phenomenon in children described by Johnstone has been noted only in cases treated in hyperextension. As this overgrowth has the effect of partially correcting such deformity as is present, everything must be done to encourage its development—another argument in favour of hyperextension. I am not yet in a position to say how frequently compensatory overgrowth occurs, but Johnstone who has devoted a number of years to the treatment of surgical tuberculosis has said that it is by no means uncommon.

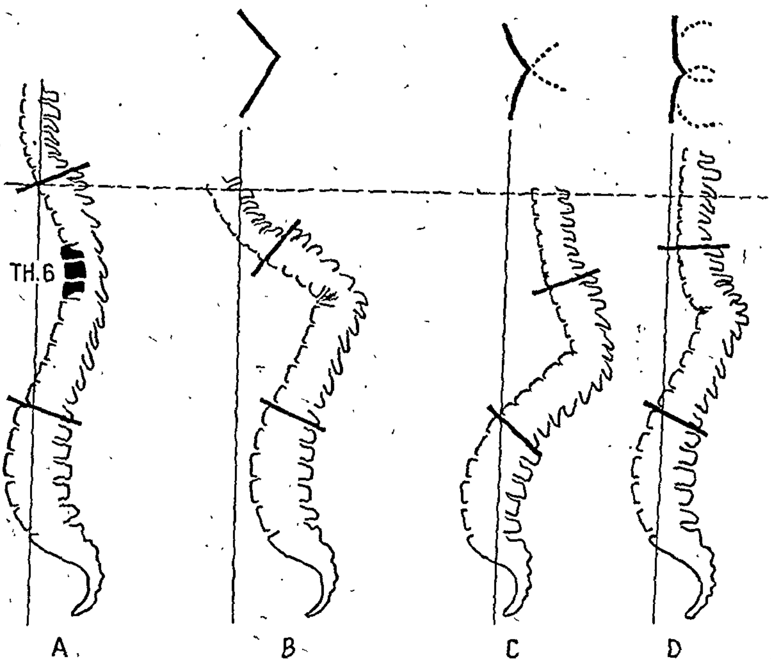

FIG. 11.—(A) Lesion involving body of Th. 6, and adjoining portions of Th. 5 and 7. (B) Uncompensated kyphosis. (C) Natural compensation. (D) Ideal compensation.

APPLICATION OF THE METHOD

What is the best form of hyperextension apparatus? There is no one answer to this question. Any apparatus complying with the conditions already laid down is satisfactory provided that it is used intelligently. I have found that the narrow gas-pipe frame as used by Whitman leaves little to be desired (Fig. 10).

For how long should hyperextension be continued? It is obvious that no change of treatment should be contemplated until there is definite evidence that the disease is becoming quiescent. As in tuberculosis of the hip, our main guide is the appearance of the lesion as seen in radiograms taken at regular intervals of three or four months. One maintains hyperextension until radiography shows, first, cessation of bone destruction over a period of about eight months; secondly, recalcification of the involved vertebræ; and thirdly, improvement in the definition of the bone where erosion has been taking place.

When these signs of quiescence are present (and it may be two or three years from the inception of treatment before they appear) it is time to allow the vertebræ to fall together and fuse. In most cases, in spite of our efforts, several vertebral bodies have been attacked and a definite gap is present. This must be allowed to close; it is the natural process of healing in this disease. The patient should be turned on to his face and nursed in an anterior shell. There is now nothing to prevent collapse at the level of the lesion, and an opportunity is provided for the development of the erector spinæ muscles which suffer considerably when a patient is immobilised for many months on a frame.

When good apposition of the diseased vertebræ has occurred (and it is easily demonstrated radiographically) many surgeons are satisfied that treatment in recumbency has come to an end. A brace is supplied and the patient is discharged from hospital.

But there is another phase of treatment, the development of compensatory curves—a form of treatment that has received more attention on the continent than it has in this country, although the valuable work of Pugh at Carshalton, Waldenstrom[8] in Stockholm, and Calvé[9] at Berck, was recognised long ago.

It is clear that the kyphotic spine tends to become more angulated under the influence of gravity the moment the patient begins to walk (Fig. 11). An increase in angulation means movement at the site of disease and crushing of the involved vertebræ, both extremely undesirable processes. The natural defence against increasing angulation is the development of compensatory lordoses above and below the lesion. Unfortunately the natural curves are often incomplete or even absent, particularly in the thoracic spine, and when such curves do appear they are always long and are segments of large circles. Furthermore, as Calvé has pointed out, and emphasised again recently,[10] the natural compensatory curves not only look ugly but result in considerable shortening of the trunk.

The effect of a compensatory curve is to shift the line of action of gravity posteriorly, so reducing the force acting on the arm of the lever formed by the segment of the spine above the lesion.

Butler is strongly of the opinion that an uncompensated spine is always liable to reactivation of the disease and the development of late onset paraplegia, and the case reports that he has collected seem to bear out his contention.[1]

Where bone destruction has been negligible the natural compensatory curves that develop when a patient is nursed on his face after the termination of hyperextension on a frame are quite adequate. In cases where bone destruction has been marked more active measures are necessary: short curves forming segments of small circles must be induced above and below the lesion. This may be accomplished by keeping the patient on the posterior frame, and placing thick pads of suitable material, such as spongy rubber, immediately above and below the kyphos, so as to produce curves in the most advantageous positions. Where a curve is required in the interscapular region, a central pad is used which presses on the spine between the scapulæ.

The lumbar and cervical curves are only too easy to produce; the difficulty is to produce a marked lordosis in the thoracic region, where one's efforts are resisted by the lack of extension normal to the thoracic spine, and by the rigidity of the thorax. But it can be done.

Let us suppose that the tuberculous focus is quiescent and that adequate curves have been developed above and below the lesion. How is this ideal position of the spine to be maintained? Most surgeons fit the child with a brace, and in many cases it is sufficient. Yet one is tempted to consider spinal fusion as a better form of treatment—a grafting operation designed not only to fix the affected vertebræ and their immediate neighbours, but extending to the adjoining parts of the compensatory curves. Waldenstrom [8] has pursued this policy for a number of years, even in children, and his results are most impressive. If we regard spinal fusion as the most perfect form of spinal support at our disposal, then we have here an admirable field for the operation worthy of wide exploration. Spinal fusion for active disease in children has been tried and found wanting, but it may well be that the operation will prove useful in rendering permanent the good results of conservative treatment.

THE ANEURYSM PHENOMENON

The condition that I have called the aneurysm phenomenon in thoracic caries generally passes unrecognised and consequently the question of special treatment is never considered. Ghormley seems to be the only surgeon who has taken the matter seriously, and he has discussed the possible indication for operation in cases where the condition is present.

He was of the opinion that collapse of all the eroded vertebræ would occur ultimately, even where no true secondary foci had appeared. Costo-transversectomy at an early stage was recommended to empty the abscess, so limiting its longitudinal spread and the depth of the mechanical erosion of the vertebræ adjoining the primary focus. If collapse of the eroded vertebræ does occur, then operation would certainly be justifiable. But in all of the 12 cases that I have followed, there was no suggestion of collapse in any single case. In one case of unusually deep erosion the child has been under constant observation for five years, and there has never been any sign of curvature except at the primary focus of disease. There is, therefore, no justification for interference in the purely aneurysmal type of destruction, and if spinal fusion is contemplated during the later stages of treatment the eroded vertebræ may be regarded as normal for the purposes of operative fixation.

But the possibility of secondary foci making their appearance suggests that the aneurysm phenomenon may after all call for operative intervention, and costo-transversectomy is the only operation that might be of value.

Yet we must remember that secondary foci appear only occasionally, and it would hardly seem right to subject all cases of aneurysmal erosion to costo-transversectomy for the sake of avoiding the secondary foci that might appear in a few cases if the operation were not performed. The conclusion is, therefore, that aneurysmal erosion does not call for any special treatment, but vigilance is required to detect the appearance of secondary foci: routine lateral radiography of the spine is the only means at our disposal for following the progress of this interesting complication of caries of the thoracic spine.

Much of the work embodied in this paper is based on the routine radiographic examination of a large number of cases, and I must express my thanks to my colleague Mr. C. W. Durward for the infinite pains that he has taken in the production of several hundred faultless X ray pictures.

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CONTROL OF WHOOPING-COUGH WITH SERUM AND VACCINE

THE USES OF A NEW SKIN TEST

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THE object of this paper is to give a short review of efforts made during the past ten years to combat and control pertussis, and to put forward (1) a method of preventing the disease in susceptible contacts, and (2) a method of vaccination, controlled by skin test, which affords active immunity.

There are, on an average, 40,000 cases of whooping-cough [1] annually in London alone, and Stocks and Karn [2] maintain that "it is the most important epidemic disease in the great Metropolis in causing physical suffering, loss of school attendance, impairment of physique, and mortality." At its worst it is the cause of between 2000 and 3000 deaths per year in England and Wales.[3] Much work has been done in an attempt to control the disease, as has been done in the case of diphtheria and small-pox, but so far with small success. Methods of treatment are of two kinds:—

(1) Treatment *during an attack*, in an effort to alleviate the symptoms and shorten the course of the disease.

(2) Treatment by *prevention of an attack*, in an effort to immunise the child in infancy.

Treatment with Convalescent Serum

Various remedies have been tried for this acute disease, with little or no success. One worker, however, stands out, in that his line of approach was from a different angle. Jundell [4] in Stockholm aimed at procuring human serum with a high antibody content to treat children already infected with whooping-cough. His method was to raise the antibody titre in the serum of adults, who had had pertussis previously, by injecting three five-daily doses of whooping-cough vaccine, and bleeding them five days later. The serum was then given to the infected child, the total quantity being not less than 60 c.cm. Jundell [4] prefers to treat children in the catarrhal stage, or the first two days of the spasmodic stage, and in the five cases which he describes in detail all the children had fewer and milder paroxysms than the non-treated control children.

One of us (R. G. W.) working at the Westminster Hospital for the past four years, has made use of convalescent human serum, first in treatment and later in prophylaxis. In the treatment some 25 to 30 consecutive cases, which had been admitted to a fever hospital as clinical whooping-cough, received, on admission, doses of serum varying from 5 to 25 c.cm. No apparent improvement in the clinical condition, such as reduction in the number of whoops per 24 hours, occurred, nor was the total period of illness diminished. It is of interest to note that though these cases were unselected as regards the day of the disease, or severity of illness, none of the patients developed complications, and all recovered.

Prophylaxis with Serum

Since the therapeutic effect of convalescent serum was doubtful, it was decided to try convalescent serum as a prophylactic agent. At the time this portion of the work was undertaken it was not possible to select known susceptible cases on which to practise prophylaxis. Natural immunity was an unknown factor always to be considered.

The ideal method of approach seemed to be the selection of cases in families of children living under conditions of overcrowding. On the first diagnosis of the disease in one child, half the remainder of presumably susceptible children received serum, whilst the other half received no serum. This apparently ideal method did not, however, take into consideration the fact that those who received serum might be naturally immune, or already well advanced in the incubation stage. The results accordingly might well be inconclusive. Further difficulties were encountered, since the number of occasions on which a family was large enough for the satisfactory performance of this experiment was necessarily limited.

Where possible, this method, with controls in the same family, was employed, but there have of necessity been far greater opportunities of attempting prophylaxis in families of two children only. In these cases it was usual to find one child in the whooping stage, whilst the other presented no clinical evidence of the disease. In such cases it was the investigator's practice to give the unaffected child a dose of serum immediately the nature of the disease in the affected child was recognised. Since the incubation period of whooping-cough is a matter of speculation, but is probably in the neighbourhood of 14 days, one is always in doubt as to the stage of incubation which may already have been reached by a presumed susceptible who is to receive serum.

In a series of 95 definite "contacts"—not previously infected, as far as could be ascertained—between the ages of 1 month and 4 years, the majority of whom were not at any time satisfactorily segregated from the source of infection, treated with convalescent serum before there was any clinical evidence of whooping-cough :—

40 (42 %) did not develop the disease.
31 (32 %) developed the disease, but had a "mild" attack.
24 (26 %) developed the disease in an unmodified form.

In a series of "control contacts" in the same age-class, and similarly only partially segregated from the source of infection, and who did not receive serum :—

6 (11 %) did not develop the disease.
11 (20 %) had a "mild" attack.
38 (69 %) developed the disease in an unmodified form.

That is to say, 42 per cent. of patients receiving serum appear to have been fully protected against the disease, but it was not possible to say for certain whether this represents a higher proportion than that of the naturally immune portion of the child population, though it is a higher proportion than in the control series.

In the case of the 32 per cent. who developed the disease in a mild form, it was noted that the catarrhal stage began within ten days of receipt of the serum, and usually within a week. The disease was presumably approximately half-way through the incubation period before serum was administered.

The 26 per cent. of cases developing the disease in the unmodified form were represented by 21 patients to whom serum was given at the end of the incubation period, as evidenced by the fact that the disease was clinically recognisable within two days of receipt of the serum, and by 3 who had received serum early in the incubation period, as evidenced by the fact that the disease was not clinically recognisable until a fortnight or three weeks had elapsed. Again, it is of interest to note that no case developing the disease after serum injection developed complications or proved fatal.

Since this work has been carried out the development of an intracutaneous skin test suggests a modification which may usefully be employed in future investigations, and which would have materially enhanced the value of the preceding work; that is, the skin-testing of patients before administration of serum with a view to determining whether they are susceptible to pertussis, and after receipt of serum to determine whether they have become immune.

PREPARATION OF SERUM, DOSAGE, AND INJECTION

Blood was collected from convalescents not earlier than one week after all whooping had ceased, and preferably within a month of the termination of the illness. Serum was separated, and the sera from several cases were "pooled." The pooled serum was filtered through Seitz filters, and 0·5 per cent. phenol was added as preservative. The serum was then put up in 10 c.cm. ampoules and kept cool. Various doses have been employed, but it is now the practice to give 10 c.cm., irrespective of age, in one dose, deeply into the gluteal muscles. No untoward "reaction" has been observed to follow such treatment.

Prophylaxis with Vaccines

In 1921, one of us (D. P.)[8] conducted an investigation into 1000 cases, with James Smellie. Actually in 100 cases, those treated with vaccine (first injection containing 500 million, second injection 1000 million, third injection 2000 million, at weekly intervals) took longer to stop coughing and whooping than those cases of whooping-cough which were untreated.

Again in 1931, one of us (D. P.) took part in a large-scale investigation into the treatment of whooping-cough by a fresh vaccine prepared by Bordet himself. The investigation was undertaken by the Ministry of Health, who asked the London County Council, the Great Ormond-street Hospital, and St. Thomas's Hospital to coöperate. The results were uniformly unsatisfactory, those cases treated being as prolonged, or more prolonged, than those cases untreated. Some hundreds of children were injected.

Quite recently Stalling and Nichols [7] have reported good results with an active undenatured antigen.

Sauer [6] attempted to immunise children by the use of a vaccine, and in its preparation he observed that hæmolysis was more pronounced in the cultures of freshly isolated strains than in cultures of long standing. He therefore made a vaccine from fresh strongly hæmolytic strains of the Bordet-Gengou bacillus, grown on human blood for 48 hours, mixed with 0·5 per cent. phenolised physiological solution of sodium chloride. Sauer states that it is diluted so that 1 c.cm. equals 10,000 million bacilli. He injected 394 selected non-immune children, and gave a total of 7–8 c.cm. (70–80 thousand million bacilli), divided into three weekly injections. During five years the 31 *control children* in 24 of the families contracted whooping-cough, 29 of the injected children were exposed throughout the incubation, catarrhal, and paroxysmal period, but *none* contracted the disease. Although the dose Sauer gives is three times as strong as Madsen[9] gave, no marked local or general reaction occurred, and he believes the immunity is completed in four months, and lasts for years.

The Skin Test

Realising the importance of Sauer's work, and the possible potency of the vaccine prepared according to his directions, an effort has been made to produce a satisfactory test which could be used in the consulting-room to show—

(*a*) Whether a child has had an infection of the Bordet-Gengou bacilli, on some previous occasion.

(*b*) Whether specific treatment in a non-infected child had been of any avail after a course of injections.

To this end various efforts have been made. An agglutination test was first attempted, but proved inadequate, owing to the fact that human serum was used in the preparation of the vaccine, which completely distorted any results obtained, and also the test was considered too elaborate for most medical practitioners to perform. Marshall Findlay (Wellcome Laboratories), working in connexion with the authors, found that on immunising rhesus monkeys with Sauer's vaccine they gave a positive intracutaneous skin test 10 days after the second injection of vaccine. (The first injection of vaccine had been given 10 days previously.)

The vaccine is injected intradermally into the flexor surface of the forearm, the result being read at 24 and 48 hours. A positive test is seen as an area of hyperæmia around the site of the injection, ranging in size from a sixpence to a shilling in diameter. It is transitory in nature, and some experience is required to make accurate readings. It should be seen in 24 and 48 hours, and tends to disappear after this. Just as a marked reaction may be expected in adults with the Mantoux test, the same marked reaction may be expected in adults with this pertussis test, and smaller quantities, even 0·05 c.cm., will give a very definite positive.

THE TEST IN USE

Observations have been made on four groups of children—

(*a*) Seventeen children were seen in the catarrhal stage of whooping-cough, and gave a negative skin-test, but developed a positive skin-test later on in the disease. The following are examples:—

A. B. 3½ years. Cough for 14 days. Skin-tests: May 28th, negative; June 11th, positive.

C. D. 6 years. Cough began Dec. 11th, 1934. Vomited, whooped. Skin-test done at various intervals was negative. Became positive Jan. 1st, 1935, 4–5 weeks after infection.

(*b*) One hundred children were tested in the ward and at out-patients, some with a history of having had whooping-cough, and others with no such history. Of these, 52 cases gave a positive skin-test, and 48 a negative.

(1) 45% gave *negative* skin-test and had a *negative* whooping-cough history.

(2) 33% gave a *positive* skin-test and had a *positive* whooping-cough history.

(3) 3% gave a *negative* skin-test with a *positive* whooping-cough history.

(4) 19% gave a *positive* skin-test with a *negative* whooping-cough history.

(*c*) Seven children who gave no history of pertussis, but whose parents desired them to be immunised, gave a negative test before the injections with Sauer's vaccine, and developed a positive skin-test at a later date. The following are examples:—

I

Baby, aged 9 months. Negative skin-test.

Right arm (deltoid).	Jan. 8th..	1·0 c.cm.		
Left ,, ,,	,, 11th..	1·0 ,,		
Right ,, (triceps).	,, 15th..	1·5 ,,		
,, ,, ,,	,, 18th..	1·5 ,,		
,, ,, (biceps).	,, 22nd .	1·5 ,,		
,, ,, ,,	,, 25th..	1·5 ,,	=8 c.cm.	
Intracutaneous test.	Jan. 25th..	Positive.		

No effect on the child was noticed by the mother, except slight fretfulness on the night of the first injection.

II

Boy, aged 2 years 11 months. Negative skin-test.

Right arm (deltoid).	Jan. 11th..	1·0 c.cm.	
Left ,, ,,	,, 15th..	1·0 ,,	
Right ,, (biceps).	,, 18th..	1·5 ,,	
Left ,, ,,	,, 22nd .	1·5 ,,	
Right ,, (deltoid).	,, 25th..	1·5 ,,	
,, ,, ,,	,, 29th..	1·5 ,,	=8 c.cm.

Skin-test, Jan. 29th, positive; March 20th, positive.

III

Boy, aged 11 months.

Right arm (deltoid).	Jan. 11th..	1·0 c.cm.
Left ,, ,,	,, 15th..	1·0 ,,
Right ,, (biceps).	,, 18th..	1·5 ,,
Left ,, ,,	,, 22nd .	1·5 ,,
Right ,, (deltoid).	,, 29th..	1·5 ,,
Left ,, ,,	Feb. 2nd .	1·5 ,,

This child was under observation in Westminster Hospital for the whole course of the injections. After the first injection a rise of temperature was observed, and subsequently on each occasion, but less marked each time.

Skin-test: Feb. 5th, positive.
Blood count: Normal, after course of injections.

Recent inquiry revealed that none of the children who were vaccinated have come into contact with active pertussis up to the present time, nor have they developed the disease.

Technique of Immunisation

The procedure of active immunisation of suitable cases is as follows. It varies slightly from that recommended by Sauer in that three bi-weekly injections are made instead of three weekly ones. Alternate arms are used each time, the deltoid region being injected the first week, and the triceps region the second week, the deltoid region again being used the third week. The dose is—

1st injection	right deltoid	..	1·0	c.cm.	3 days later.
2nd ,,	left ,,	..	1·5	,,	4 ,,
3rd ,,	right triceps	..	1·5	,,	3 ,,
4th ,,	left ,,	..	1·5	,,	4 ,,
5th ,,	right deltoid	..	1·5	,,	3 ,,
6th ,,	left ,,	..	1·5	,,	
Total	.. ..	..	8·5	,,	=85 billion bacilli.

Skin-tests are performed before, during, and after the injection. The skin-tests became positive approximately one week after the last injection. This appears to show that, contrary to what Sauer claims for the vaccine, an allergic state is developed which gives a hypersensitiveness to the skin 3–4 weeks after the initial dose of vaccine, and the child then shows a positive skin-test. This gives the physician some idea as to whether or not the treatment is effective, and agrees with the result of vaccination in other diseases. Whether or not immunisation is complete then it is difficult to say. Possibly it reaches its height at four months, as Sauer suggests.

Summary

(1) Convalescent serum from cases of whooping-cough has been used with definite benefit in the prophylaxis, but doubtful benefit in the treatment, of pertussis. (2) A preliminary description is given of a skin-test which can be used both to diagnose whooping-cough in an early stage, and also to pick out those children who are susceptible to the disease. (3) The pertussis skin-test is further evidence that children can be immunised against whooping-cough by the giving of a suitable vaccine. (4) Children who give a negative skin-test can be made to give a positive skin-test by the injection of the vaccine.

Our thanks are due to Dr. Marshall Findlay and the Wellcome Laboratories for help with the experimental side of this investigation, and we are indebted to Dr. Findlay for demonstrating the intracutaneous pertussis test experimentally first on monkeys. We are also indebted to Eli Lilly and Co., Ltd., for supplying us with the necessary amount of Sauer's vaccine required in carrying out these tests.

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THE "PREGNANCY" TEST IN RELATION TO DEATH OF THE OVUM

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THE practical value of the Aschheim-Zondek and of the Friedman tests for pregnancy is now clearly established. In the diagnosis of uncomplicated pregnancy the tests are extremely reliable and most workers report an accuracy of about 98 per cent. The test has also been employed in the diagnosis of hydatidiform mole and chorion-epithelioma, both of which conditions give very strong pregnancy reactions, as little as 1/2000 of the normal dose of urine being required in some cases to give a positive result. Recently studies have been made on the hormone content of the blood and urine in connexion with certain complications of pregnancy, such as hyperemesis, toxæmia, and eclampsia.

It is therefore natural that the clinician should now appeal to the laboratory worker to assist him in diagnosing death of the fœtus in utero.

Of what value are the biological tests for pregnancy in the diagnosis of intra-uterine death? How long after the death of the fœtus do the tests remain positive? The present communication is an attempt to solve this question. It summarises the results given by the test in a consecutive series of cases in which the date of fœtal death could be determined clinically with some degree of certainty.

The Friedman test was employed in all the cases of the present series. The method of performing the test has been described in detail elsewhere (Bishop, 1933), and will therefore be briefly summarised only:—

An adult doe rabbit which has been segregated for 24 hours is submitted to abdominal laparotomy for inspection of the ovaries. 10 c.cm. of filtered urine for diagnosis is injected intravenously in a single dose. After a minimal interval of 36 hours the ovaries are again inspected by laparotomy. Three possible changes may occur, either singly or in combination: (1) increase in size and prominence of pre-existing ripe Graafian follicles; (2) the appearance of fresh corpora lutea; (3) hæmorrhage into unruptured follicles, the so-called corpora hæmorrhagica. The first of these changes represents a weak positive result. Should either or both of the other reactions occur the result is definitely positive. If none of the changes occurs 10 c.cm. of urine obtained from a woman known to be pregnant are injected intravenously, and again, after a minimal interval of 36 hours, the rabbit is submitted to operation and the ovaries inspected. If the typical changes are present it has been shown that the rabbit will react to urine of pregnancy, and the test can be confidently reported as being negative. If the ovaries still remain unchanged it is obvious that the particular animal employed is resistant to urine of pregnancy, and it is therefore discarded as being an unsuitable test animal, and the procedure is repeated on another rabbit. This modification of the original Friedman technique is designed to eliminate the rabbit as a source of error in the test.

The series is summarised in the accompanying Table. It will be seen that on two occasions (Cases 2 and 5) the test was still positive six weeks after death of the fœtus. Apart from these two cases the test tends to become negative between 10 and 24 days after intra-uterine death has taken place.

Table giving Summary of Cases

No.	Interval between death of ovum and performance of test.	Result of test.	Interval between death of ovum and expulsion or delivery.	Stage of pregnancy at which ovum died.	Condition of placenta and remarks.
1	3 d.	P.	3 d.	7 m.	Placenta 4 lb. Very bulky and pale. Section: active chorionic tissue. Fœtal ascites.
2	6 w.	P.	10 w.	6 m.	—
3	1 w. 3½ w.	P. N.	5 w.	—	— —
4	9 w.	N.	—	4½ m.	—
5	6 w.	P.	—	5 m.	—
6	6 d.	P.	—	—	—
7	14 d. 21 d. 28 d. 35 d.	W.p. W.p. N. N.	52 d.	8 m.	Placenta completely infarcted. Hormone excretion normal at fifth month.
8	10 d.	P.	10 d.	8 m.	Placenta normal. Section: active chorionic tissue.
9	8 w.	N.	8 w.	5½ m.	No gross infarction. Healthy villi. Some degeneration of connective tissue.
10	36 h.	W.p.	6 w.	—	—
11	47 d. 56 d.	N. N.	72 d.	6 m.	Grossly infarcted.

W.p. = weak positive; N. = negative; h., d., w., m. = hours days, weeks, months.

These observations are supported by the reports of other workers (see bibliography). I have been able to find reports of only 31 cases in which the exact date of fœtal death was determined clinically. In most of these the Aschheim-Zondek rather than the Friedman test was performed, and many of the tests were positive as long as 40 days after death of the ovum. The reason why the Aschheim-Zondek test remains positive rather longer than the Friedman test is because infantile mice are more sensitive to prolan of pregnancy urine than adult rabbits, and will therefore detect smaller concentrations of the material. For instance, in normal pregnancy the Friedman test becomes negative within 48 hours of parturition (Bishop), whereas the Aschheim-Zondek test usually takes about 7 days (Aschheim).

Both Aschheim and Bulliard report cases in which the test was positive three months after fœtal death.

Bué, Palliez, and Gernez describe a case in which the test was positive 10 weeks after the fœtus had died at 3½ months.

Brouha and Hinglais, using infantile male mice as the test animals, obtained a positive result 2 months after death of the ovum.

Stewart investigated a case by the Aschheim-Zondek method, and found a positive reaction 1–2 months after the ovum had died.

Runge and Clausnitzer made very complete quantitative observations on the hormone content of the urine in two cases of intra-uterine death. They report that both the œstrin and the gonadotropic hormone concentrations are considerably less than they are at the same period before normal parturition, but that the œstrin level falls very much more rapidly than the gonadotropic hormone level.

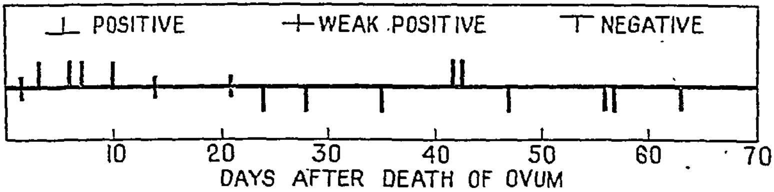

Chart showing 16 reactions obtained in 11 consecutive cases in which the date of the death of the ovum was known.

Westman investigated a case of intra-uterine death of a 7 months' fœtus. Immediately after the death of the fœtus the patient developed rapidly progressive signs of a pregnancy toxæmia. Three weeks after the fœtal movements had ceased to be felt an Aschheim-Zondek test was positive. Six days later a macerated fœtus was delivered by Cæsarean section, and the placenta was examined histologically. Apart from some thrombosis of the stromal vessels the tissue appeared normally active. Implants of the placental tissue were made into infantile mice, as the result of which a fairly strong œstrin reaction developed in the uterine horns, but there was no evidence of ovarian stimulation. From this it appeared that though œstrin was still present in the placenta, the gonadotropic hormones had completely disappeared. Westman suggests that the anterior pituitary had taken over the secretion of the gonadotropic hormones at the time of fœtal death. This would explain the positive Aschheim-Zondek reaction in the urine and the negative reaction with the placental implants. He further postulates that the pituitary may continue to elaborate an excess of gonadotropic hormones for some time after death of the fœtus, so that the urinary Aschheim-Zondek reaction is relatively slow in becoming negative as compared with the rapid disappearance of œstrin.

Spielman, Goldberger, and Frank report a series of 33 cases, but in only 12 of them does the exact date of fœtal death appear to have been clinically determined. In most of the cases both the œstrin and the Aschheim-Zondek tests were performed, the former becoming negative much earlier than the latter, though on one occasion the œstrin test was still positive 23 days after fœtal death.

DISCUSSION

The subject under review is of importance not only from the practical point of view but also from the scientific standpoint. There is sufficient evidence to make it clear that during pregnancy the placenta takes over the function of the anterior pituitary and elaborates a gonadotropic substance, the excess of which is excreted in the urine. That the tissue responsible for the secretion of this factor is the chorionic villus is shown by the fact that in hydatidiform mole the amount of hormone excreted is hundreds of times more than in normal pregnancy. Furthermore, this enormously increased excretion may occur even in the absence of pregnancy, as in the case of chorion-epithelioma, either in the female or in the testis of the male. It would appear, therefore, that the Aschheim-Zondek and Friedman tests depend primarily on the *presence or absence of functional chorionic tissue* and *not on the life or death of the ovum*. Since, however, the main function of the placenta is to provide a means of nourishing the living embryo, one would expect it to become inactive on the death of that embryo. Aschheim states that the factor responsible for a positive "pregnancy" reaction is the biological contact between the maternal blood and the chorion-epithelium; but this is not always true. It is quite common to get a moderately severe post-partum hæmorrhage after the abortion or delivery of a macerated fœtus, showing that there is an adequate maternal circulation in the intervillous spaces, and in some of these cases the pregnancy test at the time of delivery has been negative. For instance in Case 9 the patient had a post-partum hæmorrhage of a pint. Furthermore, the strength of the pregnancy reaction is not necessarily proportional to the amount of placental tissue. In normal pregnancy the reaction is stronger in the earlier months when the placenta is small and growing than it is towards term, when the placenta is fully grown and bulky. Finally, the activity of the chorionic tissue, as measured by the pregnancy reaction is not necessarily reflected in its microscopical appearance. It is quite possible for the pregnancy reaction to be negative in the presence of apparently healthy villi, as seen under the microscope. This occurred also in Case 9, and on another occasion I obtained a negative Friedman test in a case of retained products, where quite a large piece of placenta had shown perfectly healthy villi in contact with the maternal circulation.

The results cited in this paper make it clear that there is no direct relation between the death of the ovum and the disappearance of gonadotropic substance from the urine, nor should we expect this to be so, on theoretical grounds, for there is no reason to suppose that the fœtus itself produces the gonadotropic factor. Furthermore, the time after the death of the ovum at which the placenta ceases to elaborate the gonadotropic hormone seems to vary considerably in individual cases, and to be determined by no mechanism so far understood. Westman's theory that the anterior pituitary takes over the function of secreting the gonadotropic factor from the placenta immediately after the death of the embryo is interesting, but is not, to my mind, proved by the case which he has studied. In this case 6 days intervened between the collection of the sample of urine which gave a positive Aschheim-Zondek reaction and the implantation of the placental tissue into the infantile mice, which resulted in no ovarian stimulation. Had a second specimen of urine been taken at the time of the Cæsarean section, and had it again given a positive Aschheim-Zondek reaction, Westman's case might have been more convincing. His theory requires thorough experimental investigation before it can be accepted.

CONCLUSIONS

(1) Where intra-uterine death is suspected clinically, a negative pregnancy reaction will confirm this suspicion; but a positive reaction may still occur as long as three months after the death of the ovum, and cannot therefore be accepted as showing that the fœtus is still alive. (2) A comparison between the œstrin reaction and the Aschheim-Zondek and Friedman tests shows that the former becomes negative considerably sooner after fœtal death than the latter. It may, however, still be positive three weeks after death of the ovum, so that a positive result is by no means certain evidence of a living embryo. (3) The results obtained in the cases investigated throw no fresh light on the factors which regulate the secretion of gonadotropic hormones by the placenta.

I am indebted to Mr. G. F. Gibberd, assistant obstetric surgeon to Guy's Hospital, for the interest he has taken in this work, for supplying me with the clinical details of some of my cases, and for having the placenta histologically examined in a number of the cases.

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THROMBO-ANGIITIS OBLITERANS

(BUERGER'S DISEASE)

GASSING AS AN ÆTIOLOGICAL FACTOR

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The following case was referred to us because the patient thought of claiming a pension for thrombo-angiitis obliterans on the ground that it was a disability arising from gassing.

He was a man aged 44 at the time of examination in May, 1934, and he had always enjoyed good health until joining the Army in 1914, at which time he was classed as A1. In 1915 he was severely gassed, and after this he suffered considerably from a troublesome cough and increasing breathlessness. On his discharge from the Army in 1919, he attempted to continue at his former work as a bricklayer but had to give up because of his cough and breathlessness, and in 1922 he obtained a pension for bronchitis as "a permanent disability resulting from his gassing." About this time he developed cramp-like pains in the calf of his right leg, with numbness and coldness of the toes. These symptoms were apparently worse in cold weather and also after resting. With the passage of time the symptoms became progressively more marked, and in 1924 he developed an ulcer under the nail of the second right toe which proved resistant to treatment and became septic, the toe having to be amputated in October, 1924. The amputation wound never healed satisfactorily. The Wassermann reaction of both blood and cerebro-spinal fluid was negative; tubercle bacilli were never found in the sputum and tissue examination for tuberculosis and leprosy also proved negative.

In October, 1928, the third toe of the right foot was amputated for gangrene, and in December of the same year the limb had to be amputated above the knee because of extension of the gangrene up the leg. The amputated limb was sent for full pathological examination and the report confirmed the diagnosis of thrombo-angiitis obliterans. The left leg became involved in a similar manner, and in April, 1931, amputation above the knee was carried out.

On examination in 1934 he was found to be in fair general health only. The pulse-rate taken at the precordium was 84 per minute. No radial pulse could be made out on the right side and the pulse on the left side was only just palpable, and easily obliterated with slight pressure; the vessel wall was somwhat thickened. The blood pressure on the right side was 124/66, and on the left was 140/78. The pupils were equal in size and shape and reacted to light and accommodation. There was no conspicuous sepsis in the teeth or gums. An interesting feature was the presence of multiple lipomata on the right arm and back. There was discoloration and dystrophy of the nails of the right hand with trophic changes at the bases, these being most marked on the little finger where there was also some superadded sepsis. Both hands were cold and cyanosed.

The chest was well covered, with no definite impairment of the percussion note on either side. Breath sounds were a little harsh at the apices, but no adventitious sounds were heard. A good deal of bronchitis was present on both sides of the chest, and even on rest there was a good deal of dyspnœa. The veins of the face and neck were somewhat dilated. The X ray picture of the chest showed no pulmonary infiltration due to tuberculosis, but there was increased translucency over both sides due to a considerable degree of emphysema. The heart sounds were normal except for some accentuation of the second sound at the pulmonary area. Abdominal examination was negative and the urine was normal. The patient has no foreign blood in his veins, and is neither a heavy smoker, nor a heavy drinker.

The diagnosis was clearly chronic bronchitis and emphysema following gassing, with thrombo-angiitis obliterans as a complication.

ÆTIOLOGY OF THROMBO-ANGIITIS OBLITERANS

Thrombo-angiitis obliterans was first fully described by Buerger[1] in 1908 and he suggested the name by which it is now known. His monograph on this and allied conditions (the "Circulatory Disturbances of the Extremities," Philadelphia, 1925) is probably the most comprehensive work on the subject. According to him, thrombo-angiitis obliterans is a condition manifesting itself most usually by indefinite or cramp-like pains in the leg, trophic disturbances, and a discoloration of the limb.

As a result of careful study on the pathology of the condition, he described three stages in the progress of the disease.

(a) A stage of acute inflammation of the vessels, the inflammatory process involving particularly the deeply situated and larger arteries and veins of the lower and upper extremities, and being rapidly followed by an extensive occlusive thrombosis.

(b) A stage of healing or organisation, characterised by the gradual disappearance of the inflammatory products.

(c) A final stage in which fibrosis of the adventitia occurred and the vessel was converted into a fibrous cord.

Thus the final result is the obliteration of arteries and veins over a large part of their course by vascularised and canalised connective tissue.

Despite the increasing attention which of late has been paid to this condition, with the subsequent clarification of its pathological features, its ætiology remains obscure. Brown, Allen, and Mahorner[2] show that the cause has been laid successively at the door of tobacco-smoking, the Hebrew race, the male sex, exposure to cold, a shortened coagulation time of the blood, and various nutritional deficiences. Meyer[3] even cites a particular birthplace as a causative factor of importance, believing that patients coming from the belt of land between the Black Sea and the Baltic Sea were particularly liable to this disease.

More important than any of these, however, is the rôle of infection. In Brown, Allen, and Mahorner's series of over 300 cases,[2] the Wassermann reaction was positive in 3 per cent. Evans[4] reports, as leading factors, the occurrence of dental sepsis, nose and throat infections, tuberculosis, prostatitis, typhoid, amœbiasis, and other chronic gastro-intestinal infections. No specific infectious agent has been isolated bacteriologically. Rabinowitz[5] has described an organism which on injection into a rabbit produced an auricular thrombus, but this work has not been confirmed and organisms are not often found in either the acute, subacute, or chronic stages. One is therefore forced to the conclusion that of the many ætiological agents which have been suggested, none fulfils the requirements of a direct causal factor.

A new method of approach to the problem was suggested by Riesman[6] in a lecture on phlebitis and thrombosis. He said, "Barcroft and other English physiologists have shown the fundamental importance of oxygen for the life of the tissues. May not, in Buerger's disease, a lack of oxygen be as important an element in the devitalisation of the tissues as the lack of non-gaseous constituents of the blood?" Meakins and Davies[7] have shown that gas-poisoning provides an example of severe and progressive oxygen-want. These workers have shown that this result, in particular, follows gas-poisoning with phosgene, which liberates hydrochloric acid in the alveoli, with a resultant local necrotic action on the alveolar epithelium and the production of an insidious œdema. Owing to its greater solubility, carbon dioxide passes out more readily than oxygen passes in—and thus a condition of progressive oxygen-want is produced. With a more severe action of phosgene in those exposed to larger and more concentrated doses, there is produced an actual necrosis of the cells with thrombosis of the capillaries. In such cases, oxygen-want becomes well marked. Meakins and Davies[7] have also shown that oxygen-want is a characteristic feature of such conditions as emphysema, chronic bronchitis, pulmonary fibrosis and chronic bronchiolitis—conditions seen in the end-results of gassing.

RELATIONSHIP BETWEEN GASSING AND THROMBO-VASCULAR LESIONS

In emphasising the importance of gassing in the production of thrombotic vascular lesions, the occurrence of such lesions both as an immediate and as a remote result may be noted. Thandavaroyan[8] reports a case of gangrene of the extremity following carbon monoxide poisoning, and a similar case is reported by Briggs.[9] Reidell mentions a case of gangrene of the leg following poisoning with illuminating gas.[10] But on the whole, extensive vascular thromboses as an immediate effect of gas-poisoning are rare, and most of the cases reported are of such lesions as a remote sequel of gassing. Thus Cole,[11] in a study of the remote effects of gassing, is struck by the fact that patients who recovered often showed gangrene of the extremities and various thrombotic tendencies throughout the body. This work was confirmed by Koch,[12] who made a careful study of autopsy material furnished by German soldiers who had been severely gassed and then died some years later. He found that thrombi were particularly liable to form in the femoral veins, the cardiac vessels, and the heart.

The consideration of the formation of thrombi as a particular sequel to gas-poisoning may be taken under three headings.

(a) *Alteration in the constituents of the blood.*—The large amount of hæmatin present in the circulating blood after gas-poisoning (particularly after phosgene) is a well-recognised fact, and according to Mayer[13] this is due to the effect of hydrochloric acid produced by the breaking down of the phosgene, as mentioned above. Vedder,[14] in a monograph on the medical aspects of chemical warfare, reports that at the height of gas-poisoning, the erythrocyte count in man was found to be well over 9,000,000. The same polycythæmia occurred experimentally in animals. The peripheral vessels are markedly contracted and the thickened blood flows feebly at the height of poisoning. A similar polycythæmia and also a marked increase in the hæmoglobin percentage was found by Barcroft and his co-workers[15] in their studies of chronic cases of gas-poisoning.

(b) *Slowing of the blood stream.*—This is noted as a secondary result to the increase in cellular content of the blood. Buerger[16] considers that the increased viscosity of the blood is one of the most important pathological results of gas-poisoning, and believes that it is partly due to the increased carbon dioxide content of the blood which produces a certain degree of swelling of the red blood corpuscles. Hergt[17] considers that the tendency to thrombosis is due to the increased concentration of the blood (Bluteindickung), the heightened coagulability, and the retardation of the blood flow.

(c) *Damage to endothelial tissue.*—The development of pulmonary œdema was referred to in the work of Meakins and Davies, and Gilchrist and Matz[18] have shown this œdema to be due to local injury of the endothelial cells which results in an increased capillary permeability. The actual mechanism in the production of the œdema is due to the increased permeability in association with the acid reaction produced by the hydrolysis of the phosgene.

Thus we see how the three main factors in the production of thrombi—viz., alteration in the constituents of the blood, slowing of the blood stream, and damage to the endothelial cells—are all intimate parts of the sequelæ of gassing.

In the case described, syphilis, tuberculosis, leprosy, gastro-intestinal disease, chronic naso-pharyngeal sepsis, and dental sepsis were all absent. The only factor left which could have produced the pathological changes in the patient's vascular tree described above, was the gassing which he sustained whilst on service, with the subsequent development of chronic respiratory disease, and we are of the opinion that the action of gassing, both directly and remotely, was an effective contributing agent in the production of the vascular lesion.

SUMMARY

1. A case of chronic bronchitis and emphysema following gassing, with subsequent development of thrombo-angiitis obliterans, is described. (2) The general ætiology of thrombo-angiitis obliterans is discussed. (3) The influence of gassing in the production of thrombotic vascular lesions is shown.

We wish to express our gratitude to Dr. L. Buerger, of New York, for his kind coöperation in this case, and for the trouble he has taken, despite his illness, to send us a lengthy personal communication in support of the view which we have advanced.

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THROMBOSIS OF THE PAMPINIFORM PLEXUS

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THROMBOSIS of the pampiniform plexus is a well-recognised result of injury or infection, but its apparently spontaneous occurrence is not so familiar. The condition is certainly not common, for, in searching the records of the surgical unit of St. Bartholomew's Hospital from 1921 to 1934, inclusive, and those of all surgical cases admitted to the same hospital from 1921 to 1928, reports of only two cases could be found. This probably under-estimates its true incidence, since, as it is rarely suspected, a certain number of cases will not have been recorded. The two following histories are reported here not only because well-authenticated examples of thrombosis of the pampiniform plexus are not common, but because the sufferers are liable to be treated by orchidectomy.

CASE 1.—A meat porter, aged 41, was admitted under Prof. G. E. Gask on April 10th, 1928. Five weeks before admission he began to feel pain in his left testicle, and this pain was increased by coughing or by lifting heavy weights, but was not affected by prolonged standing. It became worse during the first few days after the onset, then remained at about the same intensity.

During the five weeks before admission the patient had been kept under observation by his own doctor who noticed a moderate swelling in the left side of the scrotum, which had become smaller by the time he came to hospital. There had been no micturition symptoms, no cough, no night sweats, no weakness and no loss of weight.

On examination there was a hard, nodular swelling, slightly tender, of the globus major of the left epididymis. The body of the testis was normal. The vas was a little thickened but not beaded and there was no thickening of the spermatic cord. On rectal examination the left side of the prostrate was felt to be rather larger than the right, but there was no other abnormality. The patient was apyrexial, his urine was normal and general examination revealed nothing of note.

Although on consultation a diagnosis of tuberculous epididymitis was made, Mr. Paterson Ross, who was the surgeon in charge of the case, said that the short history, the diminution in size, the affection of the head of the epididymis without the tail and the absence of swelling of the left seminal vesicle made him doubtful. Orchidectomy was performed, when the epididymis and the body of the testis were seen to be macroscopically normal. At the lower end of the spermatic cord, in contact with the epididymis, was a mass of fibrous tissue apparently connected with the pampiniform plexus. Microscopical section showed a mass of fibrous tissue surrounding vessels of the spermatic cord. The walls of these vessels were thickened and they contained organised blood-clot. In the epididymis some tubules were normal and some showed in their cells dark brown granules which may have been altered hæmoglobin. There was no evidence of tuberculosis.

The patient was discharged with the wound soundly healed on the eighteenth day after operation.

CASE 2.—A shopkeeper, aged 57, was admitted under Mr. R. M. Vick on Jan. 22nd, 1935. Four weeks before admission there had been a sudden onset of severe pain in the left testicle. The pain radiated from the region of the left anterior superior iliac spine down to the scrotum, but did not go up to the back. *There had been no injury.* The pain was brought on by standing and was relieved by rest.

The patient had lost one stone in weight during the preceding year. He had no other symptoms of disease. On examination the body of the testis was found to be normal, with normal testicular sensation. The epididymis was moderately enlarged and was hard. The spermatic cord was thickened and nodular. There was no tenderness; no hydrocele was present. Rectal examination showed no abnormality. The patient was apyrexial and nothing of importance was revealed by the general examination.

A provisional diagnosis of tuberculous epididymitis was made, although the patient's age was thought to be against it and the condition was not considered typical. Orchidectomy was performed.

The gross specimen showed the body of the testis to be a little larger than normal. The epididymis and vas were normal, spermatozoa being recovered in large numbers from the latter. The veins of the pampiniform plexus were extensively thrombosed and their walls were thickened and varicose. In microscopical sections the testicle and epididymis were seen to be normal. The veins in the spermatic cord were much dilated and the largest of them was thrombosed, the clot being of varying ages. Beside the oldest part of this thrombosis the vein wall was completely destroyed and in that area there was organisation and recanalisation of the clot. The opposite region of the vein wall showed no abnormality and had no clot attached to it. *Most of the arteries showed intimal proliferation and fatty changes.* The vas was healthy and spermatogenesis appeared to be normal. The patient was discharged with the wound healed on the ninth day after operation.

DISCUSSION

Although no conclusions can be drawn from two cases, certain points may be noted. Both patients were of middle age, and in both the left side was affected. In neither was there an obvious exciting cause, such as trauma or infection, nor had there been any history of preceding varicocele or an abnormal position of the testicle. In neither case were the seminal vesicles diseased, nor were there firm nodules or softened areas in the prostrate. Active spermatogenesis was proceeding in one case and there was no reason to believe that it had been stopped in the other. Microscopically the walls of the vessels in both spermatic cords gave evidence of degeneration. The pain of one patient was of sudden onset, whereas that of the other began more gradually. The pain of the one was brought on by standing, while that of the other was not affected by standing although increased by coughing or lifting.

The differential diagnoses to be considered depend upon the stage at which the patient is first seen.

If he is examined soon after the onset, epididymo-orchitis is most likely to be simulated, whether gonococcal, coliform or the uncommon acute tuberculous type. Torsion of the spermatic cord may be suggested although in the thrombosis there would not be the associated shock and the testis would be well in the scrotum and not acutely tender. A diffuse hæmatocele of the cord would give a history of sudden onset of severe pain during some effort. Those cases which are seen a few weeks after the onset are liable to be diagnosed as tuberculous epididymo-orchitis. In these the mode of onset, the short history, the absence of any beading of the vas, and the negative rectal examination would be valuable points. The probable freedom of the tail of the epididymis from involvement may also be useful, but a hæmatogenous tuberculous epididymitis starting in the head is a possibility that impairs the value of this criterion. These later cases may occasionally resemble malignant disease of the epididymis. Mr. Russell Howard[1] mentions such a case and he has kindly supplied me with such details as can now be discovered. The man was a patient of Jonathan Hutchinson, junior, and there was an acute onset with symptoms resembling an epididymo-orchitis. After the acute stage had passed a hard lump remained just over the body of the testis. A sarcoma was diagnosed and orchidectomy performed. The specimen is now in the museum of the London Hospital (Genito-Urinary Section, No. 1584), and clinically this case resembled the first history reported in this paper.

The importance of recognising a thrombosis of the pampiniform plexus lies in its bearing upon treatment. Should it be confused with certain other diseases there is a possibility of an unnecessary orchidectomy. This is especially to be avoided, since the microscopical appearances reported here suggest that active function continues in the testicle on the affected side.

I wish to thank Prof. Gask, Mr. Vick, and Mr. Russell Howard for permission to use their cases, and Mr. Reginald Payne for kind assistance.

CONGENITAL MALARIA

WITH REPORT OF A CASE IN ONE OF TWINS

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Although, rare the occurrence of congenital malaria appears to have been proved. Non-congenital malaria in infants is very common; in the hyperendemic areas of Senegal, M. Adam concluded from his observations that every child was infected by the age of three. Congenital infection has been proved in two ways, either by finding plasmodium in the blood of the child immediately after birth, or by demonstrating it in the blood of the offspring of malarious mothers born in non-malarial districts. In the case to be described the child was born in London, and so comes under the latter heading. A case of congenital malaria occurring in England was recorded in 1924 by Llewellyn Jones and Brown,[1] when a child developed pyrexia, associated with the presence of benign tertian parasites in the blood on the sixteenth day after birth. Our case is of particular interest in that it occurred in one of twins, and we have been unable to find any previous similar record.

CASE REPORT

The infant was the second born of dizygotic twins, born at St. Pancras Hospital on Jan. 14th, 1935. The parents were a Bengali, aged 28, and an Englishwoman, aged 25. They went to live in the Rajshi district of Bengal in 1931, and the mother had her first attack of malaria in October of that year. She has had repeated attacks since, the last being in March, 1935. They had five children, the two eldest, aged seven and five, had acquired malaria in Bengal. The third, born in October, 1933, died 12 hours after birth—the mother described it as being "born with malaria, stone cold, but with its head hot and sweating." No blood examination of this child was made. *During the whole of this pregnancy, the* mother stated that she was never free from malaria.

The mother returned to England in September, 1934, during her last and twin pregnancy. During pregnancy she had one or two attacks of malaria nearly every month, the last being ten days before delivery. She suffered from slight swelling of the feet, but no other symptoms or signs of pregnancy toxæmia. She suffered no abdominal trauma or pain, and there was no evidence of concealed or evident accidental placental hæmorrhage. The labour took place in St. Pancras Hospital and was uneventful; the first born was a male (weighing 6 lb. 7 oz.) and had the fairer complexion. The second, a female, weighed 6 lb. 11 oz., and was darker, with Indian features. Both appeared to be healthy. Obstetric forceps were not used, there was no undue post-partum hæmorrhage, and no bruising of the babies was noticed. No injections of maternal blood were made into the children. Both were breast-fed for 12 days and then bottle-fed.

The female child was admitted to Highgate Hospital under the care of one of us (N. C. T.) at the age of 50 days, with a history of "crying and doubling up its legs" for four days. It had not been feverish, nor had it had any rigors. Though heavier at birth, it was now lighter and shorter than the male twin (it weighed 6 lb. 12 oz.). The child was pale. The spleen was enlarged to 4 cm. below the costal margin.

Blood examination on March 8th, 1935, revealed the following: red cells, 2,310,000 per c.mm.; white cells, 6800 (polymorph, 10 per cent.; lymphocytes, 88 per cent.; large mononuclear, 2 per cent.). Parasites of benign tertian malaria were seen. The van den Bergh test gave negative direct and indirect results. Wassermann and Kahn reactions were both negative. No active treatment was given at this stage beyond the administration of ferri et ammon. cit., grs. 12 per diem. Ten days later blood examination showed: red cells, 4,928,000 per c.mm.; hæmoglobin, 70 per cent.; colour-index, 0·72; white cells, 12,400 (polymorph, 19 per cent.; lymphocytes, 72 per cent.; large mononuclear, 9 per cent.). Malarial parasites (*Plasmodium vivax*) were still present and showed rings, half and three-quarter grown schizonts, and gametocytes. Schüffner's dots were seen in the affected red cells. Three successive examinations of the male twin showed no blood abnormality or parasites. It appeared also to have no splenic enlargement. The mother's blood showed the following: red cells, 5,024,000 per c.mm.; Hb., 90 per cent.; C.I., 0·9; white cells, 5200 (polymorph, 66 per cent.; lymphocytes, 27 per cent.; large mononuclear, 7 per cent.). Parasites of benign tertian malaria were present. Wassermann, Kahn, and gonococcal fixation tests were negative.

Progress and treatment.—During the whole of the time the child has been under our observation there has been a complete absence of pyrexia or rigors. The child was treated with Atebrin, 0·05 gramme daily (in divided doses) for five days, followed by a further course of 0·05 g. daily for four days, after a six-day interval. There was some vomiting and slight diarrhœa during each course, but no other toxic symptoms or skin pigmentation. Films taken on four successive occasions have shown absence of malarial parasites in the blood. On April 23rd the count was as follows: red cells, 5,040,000 per c.mm.; Hb., 80 per cent.; C.I., 0·8; white cells, 8800 (polymorph

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[1] A System of Surgery, London, 1932, vol. ii., p. 883.

14 per cent.; lymphocytes, 80 per cent.; large mononuclear, 6 per cent.). The spleen also appears to be diminishing in size. The child appears well, and has steadily gained weight (12 lb. on May 10th shortly before discharge from hospital).

DISCUSSION

As this child was born in January, infection by mosquito bite seems to be almost impossible, especially as a mean temperature of 60° F. for at least 16 days must be maintained for *Plasmodium vivax* to develop in anopheles.[2]

In 1910 Beckel[3] recorded 12 cases of undoubted placental transmission of malaria. Griffiths and Mitchell[4] cite several cases described between 1893 and 1928. Thonnard-Neumann[5] reports a case where he found parasites of æstivo-autumnal malaria in the umbilical cord and in the peripheral blood at birth in the child of a syphilitic mother.

Clarke[6] found among 400 placentas that 4·7 per cent. were infected with malaria, but only found parasites in the umbilical cord in one case. Graham Henson[7] made frequent examinations after birth of children whose mothers had been treated for benign and malignant tertian and quartan malaria, but found no parasites in the blood, although they were detectable in the maternal blood just before and after labour. Thibault[8] examined 246 new-born infants whose mothers had active malaria, and found only three with malarial parasites in the blood.

The actual mode of transmission of congenital malaria has not been satisfactorily proved. Blacklock and Gordon[9] found that of pregnant women examined in Sierra Leone, 30 per cent. sustained placental infection, often leading to death of the fœtus in utero or of the child within a week of birth. They never found parasites in the umbilical cord or in the infant's blood, and considered death to be due to absorption of malarial toxins. Wislocki[10] made careful histological studies of the placenta and thought it unlikely that malarial organisms could penetrate the chorionic syncitium. In this instance it is interesting to record that Ascione and Marriotti[11] claimed to produce malarial infection in ten cases by injecting blood (5 cases) and cerebro-spinal fluid (5 cases) from malarial subjects, which had been passed through a Berkefeld V. and N. filter. Panagia[12] suggested that the merozoites might go through a "filterable phase" and then regenerate. If such be true, it is possible that they could pass the chorionic syncitium in such a phase. Zozaya and Sabogal[13] were, however, unable to confirm this mode of malarial inoculation. Such a mode of infection would also be disproved in our case, as only one of twins was affected.

The general opinion is that infection follows gross placental changes or placental trauma at birth. Concetti[14] believes that a placental infarct is the antecedent. Forbes[15] thought that some abnormality of gestation or delivery could be presumed as the parasite passes the placenta so rarely. It appears that malaria in the mother need not be active in order to give birth to an infected child (Beckel and Forbes).

CONCLUSIONS

In the case which we are reporting, where the first child of twins is non-infected and the second has malaria, it might be postulated that after the birth of the first child and the commencing separation of its placenta, the uterine contractions would have caused some separation of, and damage to, the fastening villi of the second placenta before the birth of the second child, and thus enabled parasites from the maternal blood sinuses to enter the child's circulation. We think that the absence of typical bouts of temperature and rigors may be explained by a transferred immunity from the mother during pregnancy.

SUMMARY

(1) A case of congenital malaria in one of twins is recorded. (2) Treatment with iron, without specific drugs, rapidly improved the anæmia. (3) Treatment with atebrin seems to have cured the malaria. (4) It appears that, in the absence of a known placental trauma or infarct, premature placental separation was the most probable cause of the transmission of the infection.

We wish to acknowledge our indebtedness to Sir Frederick Menzies, county medical officer, for permission to publish this case, and to Dr. P. Manson-Bahr for his help and advice.

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THE EFFECT OF
SUDDEN SEVERE ANOXÆMIA ON THE FUNCTION OF THE HUMAN KIDNEY

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IN human nephritis the excretion of urea, creatinine, and ammonia are usually simultaneously impaired. Following diabetic coma, however, as McCance and Lawrence[1] have shown, the kidney may temporarily become disorganised, so that the excretion of urea and creatinine may be practically in abeyance, while that of ammonia may remain quite normal. The present paper records another example of selective functional disorganisation.

The subject of these observations was a healthy male aged 36. For experimental purposes he had on four previous occasions overbreathed for 45 minutes, and did so for the fifth time on the day in question. Everything went according to plan until the subject had finished overbreathing. Then, either from carelessness or over-confidence, he did not voluntarily begin to breathe again as he had intended to do, and as he had always done before. Acute anoxæmia inevitably followed and was sufficiently severe to cause unconsciousness for about eight minutes. For the next two hours the subject was in a very collapsed state. He sweated profusely for a few minutes and began to feel very sick. He lay in an easy chair for about an hour and then, on attempting to get up, vomited much of the water which he had drunk

TABLE SHOWING RESULTS OF ANALYSIS OF FIVE SPECIMENS OF URINE

	(1)		(2)		(3)		(4)		(5)	
Time and events.	2.45–3.45. Before over-breathing.		3.45–5.10. Overbreathing, 45 mins., then anoxæmia and unconsciousness.		5.10–6.20. Period of collapse. Vomit at 6.15.		6.20–7.30. Still collapsed. Return home by taxi. Hot bath.		7.30–10.14 bed. Recovery. Substantial meal at 9.30.	
Appearance of the urine	Normal.		Normal.		Dark, turbid and pigmented.		Dark and pigmented.		Normal.	
Urine c.cm. per minute	1·22		1·32		0·25		0·25		1·45	
Urea clearance ($U\% \sqrt{v}/B\%$) as per cent. of standard normal	107		49		17		33		114	
	A*	B*	A	B	A	B	A	B	A	B
Urea	1·28	15·6	0·56	7·4	0·47	1·20	0·88	2·16	1·25	18·0
H_2SO_4	0·126	1·54	0·110	1·4	0·376	0·94	0·404	1·00	0·101	1·46
Creatinine	0·115	1·40	0·075	1·00	0·42	1·04	0·435	1·06	0·089	1·29
Na	0·620	7·5	0·413	5·45	0·340	0·84	0·395	0·97	0·266	3·85
K	0·475	5·8	0·475	6·2	0·515	1·29	0·600	1·48	0·198	2·90
Cl	1·28	15·6	0·375	4·9	0·480	1·20	0·760	1·88	0·320	4·65
P	0·062	0·75	0·033	0·43	0·050	0·13	0·034	0·085	0·049	0·71
pH	6·8		7·4		4·8		4·9		6·8	
NH_3 (as c.cm. N/10 acid/100 c.cm. urine) ..	12·2		8·5		86·0		86·0		12·7	
Titratable acidity (do.) ..	11·0		5·3		55·0		54·0		11·0	
$NH_3 \times 100/NH_3 +$ titratable acidity	53·0		62·0		62·0		62·0		53·0	
NH_3 coefficient ($NH_3N \times 100/\text{urea } N + NH_3N + \text{creatinine } N$)	2·6		4·0		24·0		17·0		2·8	

*A = grammes per 100 c.cm.; B = rate of excretion mg. per minute.

during the course of the experiment. Feeling a little better after this, he moved about the laboratory for a short time, went home by taxi, had a hot bath and got into bed. During all this time he felt intensely cold and miserable. Soon after getting into bed he began to feel better and after about 1½ hours to feel hungry. Accordingly he ate a substantial meal and went to sleep soon afterwards. On the following morning he was normal in every way.

Five specimens of urine were obtained and analysed, and the times at which they were obtained and their relation to the salient events are recorded in the Table. It is unfortunate that no record of the blood pressure was obtained, but the subject, who was himself in charge of the experiments and the only person present likely to realise its significance, omitted to have this measurement made. The oversight however does not in any way invalidate the reported observations. In the Table also will be found a record of the analytical results.

The methods used have been those described by McCance and Lawrence[1] except that (*a*) the urea in both blood and urine was determined by modifications of Beattie's method[2] which is a colorimetric xanthydrol procedure. (*b*) The ammonia was separated from the urine in Conway and Byrne's apparatus[3] and determined colorimetrically by Nessler's reagent. (*c*) The sulphates were determined by Fiske's[6] method.

It will be noticed that the volume of urine became very small during the period of collapse and that the percentage of urea in the urine fell to about one-third of its original figure. In consequence the urea clearance (van Slyke's formula) fell from 107 per cent. of normal, before overbreathing, to 17 per cent. of normal during the period of collapse. A fall in the urea clearance of this subject during overbreathing had been observed before, but on previous occasions the clearance rose again at once. That it did not do so on this occasion but fell still further seems to have been the direct result of the anoxæmia. The clearance remained subnormal for nearly 3 hours and then rose to 114 per cent. of normal. Since no determination except that of urea was made upon the blood, no other clearances can be discussed. It will be seen from the Table, however, how "rates" of excretion were affected. The rate of excretion of urea fell to about one-fifteenth of its original figure, while that of sulphate fell only to about two-thirds. The excretion of creatinine was still less affected. The rates of excretion of sodium, potassium, chlorine, and phosphorus fell to values between one-tenth and one-fifteenth of their initial figures. The relative rates of excretion of the ions was no doubt altered to some extent by the rapid changes of pH in the urine, but the general reduction is obvious. The fall in phosphorus may have no bearing on renal function after anoxæmia, since a fall has been observed to follow overbreathing on other occasions. Turning to the excretion of ammonia, all the evidence goes to show that this was not impaired by the anoxæmia. During the period of collapse the pH of the urine fell to 4·8 and the titratable acidity rose to ten times its previous value. The percentage of ammonia in the urine increased even more and the ratio NH_3/NH_3 plus titratable acidity actually rose a little after the anoxæmia. At this time also the "ammonia coefficient" rose to the remarkably high figure of 24. If, in fact, one assumes this ammonia to have been made from urea, the very great fall in the rate of urea excretion (and the urea clearance) is in part explained. Further, the changes of urinary pH show that the kidney had lost none of its capacity to concentrate hydrogen ions. This is true also of the kidney after diabetic coma.

The theoretical interpretation of all these observations is at present rather obscure because not enough is known of the way in which urea, creatinine, and sulphates are normally excreted; and particularly of how the clearances of these three substances are related to the true glomerular clearance. The observed falls in the excretion rates of creatinine, urea, sulphates, and possibly the other salt ions, coupled with the probability that some fall in blood pressure took place, indicates some fall in glomerular filtration. Since however one cannot assume that the change in the rate of excretion of either creatinine, sulphates, or urea is proportional to the change in the rate of glomerular filtration, especially under circumstances such as these, closer analysis becomes extremely difficult and would be of little value at this stage.

On the other hand, the excretion of ammonia is known to be a special function. The process is stated to be highly susceptible to poisoning by uranium.[4 5] The present results show that, apart from diabetic coma,[1] ammonia excretion may be left unaffected by agents which interfere with the excretion of many of the other urinary constituents.

SUMMARY

After overbreathing and accidental anoxæmia with unconsciousness it was found that: (1) The process of ammonia excretion and the ability to concentrate hydrogen ions were totally unaffected. (2) The rates of excretion of creatinine and of sulphates were reduced respectively to three-quarters and two-thirds of their initial values. (3) The rate of excretion of urea was reduced to one-fifteenth of its original value. Part of this reduction may have been due to the great increase in the excretion of ammonia. (4) The rates of excretion of water, sodium, potassium, chlorine, and phosphorus were reduced to between one-fifth and one-fifteenth of their original values. (5) Recovery was apparently complete in three hours.

The author is indebted to E. M. Widdowson, L. R. B. Shackleton, and R. J. Millar for assistance with some of the determinations.

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Clinical and Laboratory Notes

ERYTHROMELALGIA AND PROCTALGIA FUGAX

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THE paper on "proctalgia fugax" by Dr. Hess Thaysen in THE LANCET of August 3rd, 1935, reminds me of a patient I attended when I was in practice in 1920, whose symptoms were unusual and interesting. On notes of the case then taken I draw for this account.

Mrs. A., aged 52, complained of paroxysmal pain in the right foot with redness and swelling of the dorsum and toes. She had had five or six such attacks during a period of three years, the attacks lasting from three weeks to two months, during which times she had severe pain on many occasions lasting from a few minutes to about an hour. Between the periods of illness the foot gave no trouble; during the bouts, even when the pain was not active, the foot did not feel quite normal and, though not obviously swollen, felt "sort of numb and too big for my shoe." This condition of affairs, I was told, had variously been diagnosed as gout, erysipelas, and inflammation of the foot. Being at that time in the throes of the composition of a thesis on causalgia, I had a mind above common diseases, and boldly diagnosed erythromelalgia, which in the light of a little more wisdom I think was correct.

The earlier attacks had consisted solely of pain in the toes and anterior part of the sole of the foot, and the redness and swelling had supervened in later attacks. Heat aggravated the condition, and she had been worse in South Africa whence she had come, than since she had been in our cooler climate. She could not bear to be near a fire during the attacks, most of which, though not all, had occurred in hot weather. The pain was an intense burning pain accompanied by sensations of throbbing, and worse when the leg was dependent. She got most comfort by lying down, elevating the leg on a pillow, and covering the foot with cloths soaked in cold water. The redness during a paroxysm, as I saw it, was quite bright and affected chiefly the great toe and little toe and the outer side of the foot. There was nothing above the ankle. As an attack subsided and the pain diminished, the skin of the foot was hyperæsthetic, stroking or gently scratching giving rise to unpleasant paræsthesiæ, and the colour of the skin became a curious pale mauve or heliotrope. No hyperidrosis, thinning of the skin, delayed desquamation, deformity of the nails or other trophic change was observed. During an attack the foot felt hot, the vessels were distended, and there was distinct swelling without pitting.

It was in the course of the treatment of this disability during an exacerbation lasting about six weeks that the disconcerting symptom of rectal pain appeared. She had four attacks of this, three in the daytime and one at night at intervals of several days. The duration was short, and on the two occasions I was sent for the pain had subsided by the time I arrived. Her description of it was graphic enough. She experienced a slowly increasing sense of fullness about four inches up in the rectum, as though there was "a small ball expanding slowly." This sensation of expansion or tension soon turned to pain which increased to an intense ache in a few minutes and which at its zenith became almost unbearable, and caused profuse local sweating of the nates sufficient to leave a damp area on the clothing nearest the skin. This pain never lasted more than five minutes at most and subsided fairly quickly, leaving a feeling of weakness and comparative exhaustion. No associated sensations in the præcordium or epigastrium as described by Dr. Thaysen were complained of, though the exhaustion after the attack amounted to a feeling of faintness. There was no accompanying feeling of tenesmus or passage of flatus. The whole attack was over well inside fifteen minutes. This rectal pain never occurred simultaneously with a paroxysm in the foot.

The patient was a woman of average build in good general health who had just passed through an easy climacteric. She had had one child with easy labour and no pelvic complications or sequelæ. There was no history of intestinal illness such as dysentery. A rectal examination revealed nothing. There were no hæmorrhoids and no trouble with defæcation or micturition. The urine was normal, the blood pressure 148/95 mm. Examination of the heart, lungs, and abdomen yielded no help, and there were no signs in the nervous system suggesting syringomyelia or disseminated sclerosis or tabes. The fundi appeared normal. Unfortunately the Wassermann tests on the blood and cerebro-spinal fluid were not carried out, but there was no history or evidence of earlier syphilis. In short, nothing was found to account for the distressing symptoms, which I did not understand.

The attacks of rectal pain were four only and did not recur at that time, and the erythromelalgia becoming quiescent I ceased to see the patient and have no further history. The whole condition was treated with belladonna, valerian, and bromide, with aspirin during the attacks of pain in the foot, together with applications of menthol and cold to the foot. No special treatment was directed at the rectal pain for which no specific cause was found and of which the evanescence probably impressed me more than its severity which I never witnessed. I have thought since that it might have been one of those painful spasms of tubular structures which are far from uncommon in neuropathic individuals.

The coexistence of the conditions erythromelalgia and proctalgia is interesting and rare and suggests a common origin. I have since seen a second case of erythromelalgia in a war pensioner, but he had no rectal pain. The ætiology of "red neuralgia" is obscure but it has been suggested that it may originate in an affection of the vasomotor centres in the cord.

Possibly some minute disturbance in the region of the lower lumbosacral roots may account for these phenomena. The equally intense and similar pain of causalgia (thermalgia) may be caused by a microscopic non-progressive lesion of a peripheral nerve. A similar lesion in another place may account for erythromelalgia and proctalgia, contemplation of which provides an interesting speculative study in neurological localisation.

A CASE OF PSITTACOSIS

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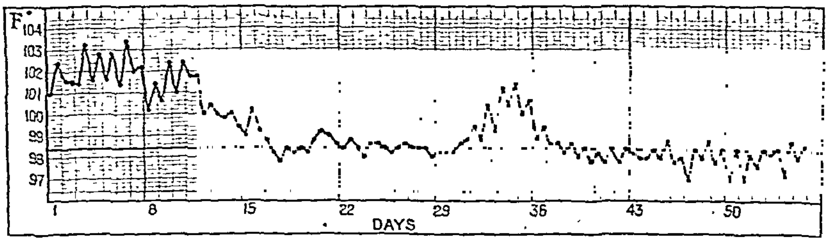
With a note by

Walter Levinthal, M.D. Munich

Psittacosis or parrot disease became widespread in Western Europe in 1929–30, and the importation of parrots and parakeets has been prohibited in certain countries. It has been suggested that the budgerigar, which is less susceptible to psittacosis than the parrot, may become a carrier of the disease,[1] and this suggestion lends interest to the following case.



Temperature chart from May 15th.

The patient is a man aged 63. He has a study in his garden connected to his house by a covered glass passage, which for the last eighteen months has been used as an aviary for 10–14 budgerigars. Consequently he has walked through the aviary several times daily. No particular illness has been noticed amongst the birds, but two or three have mysteriously died. These were purchased from two independent dealers earlier in the year.

On May 15th, 1935, the patient was seen for the first time. He gave a history of headache, pains in the back and limbs, and general malaise of twenty-four hours' duration. He was emotional and evidently felt very ill. His temperature was 101° F., pulse-rate 90, respirations 20, and his tongue was moist and coated at the back. There were no other signs of disease. On the third day of the illness an area of dullness was discovered below the angle of the right scapula. Breath sounds were diminished and heard with difficulty in this region, but there was no cough or expectoration and no pain. The temperature was maintained at 101–3°, with pulse-rate 90 and respirations 24. There was profuse sweating at night and constipation. The patient had intense headache of a throbbing character, stuffiness of the nose, and occasional slight epistaxis. He was apathetic and took little notice of his surroundings, but roused up when spoken to. At the end of the first week the symptoms were much about the same, but he was more apathetic and drowsy. The patch of dullness in the right chest was still present, and there was almost complete absence of breath sounds in this region. There was no abdominal distension or enlargement of the spleen, and there was no rash.

The Widal reaction on the ninth day of the illness was negative to typhoid, paratyphoid A and B, and *Bacillus melitensis.* Bacteriological examination of the fæces was also negative. On May 24th a specimen of sputum was sent to Dr. Walter Levinthal, at the National Institute for Medical Research, Hampstead. As a result of his tests, which are described later, he was able to demonstrate the presence of the psittacosis virus.

On May 30th crepitant râles were heard in the right chest in the scapular region, and cough and expectoration became more frequent, but were never profuse. The temperature reached the normal line and the patient felt very much better. Convalescence continued, and on June 11th, all symptoms having disappeared, the patient was allowed to get up.

A specimen of blood was sent to Prof. S. P. Bedson at the London Hospital on June 13th. Prof. Bedson later reported that the serum gave a positive reaction with the complement-fixation test for psittacosis.

On June 14th the patient complained of pain in the right scapular region. Examination revealed an area of dullness corresponding with the original patch of dullness, and there was absence of breath sounds. There was occasional cough which was painful, and expectoration of mucus streaked with a little dark blood. The temperature was 100°, with pulse-rate 90 and respirations 24. The temperature continued to rise for three days and then gradually fell to normal on the seventh day. On the fourth day the pain had practically gone, and on the sixth day breath sounds began to return, accompanied by fine crepitant râles. There was no severe headache, and perspiration was not excessive.

This case at first resembled a typhoid septicæmia. Certain features, however, distinguished it from the typhoid group of diseases. The onset was sudden and the temperature rapidly rose to its maximum. Headache was intense and perspiration profuse, necessitating the changing of the night attire two or three times a night. Constipation was the rule throughout the illness, and there were no other abdominal symptoms. The spleen was never palpable and there was no rash. During the height of the fever the patient was apathetic and drowsy, and on one or two occasions only was there a little muttering delirium.

The lung symptoms were certainly unusual. The toneless dullness, with very faint or absent breath sounds and normal or slightly increased vocal resonance, and the absence of pain, cough, and expectoration, gave a picture very different from that of lobar pneumonia. Evidently there was some consolidation of the lung, probably associated with obstruction of the smaller bronchi. Resolution was accompanied by fine râles. The fever was maintained for two weeks and subsided to normal during the third week. Throughout the illness the pulse-rate was between 80 and 90, and the respirations were never more than 24. The rise in temperature on June 14th and the return of the lung symptoms were evidence of a mild relapse.

Experimental demonstration of the virus of psittacosis in the sputum by Dr. Levinthal, and the positive reaction of the complement-fixation test obtained by Prof. Bedson, add greatly to the interest of the case.

Addendum by Dr. Levinthal

On May 25th Dr. Johnson sent me a small amount of sputum, stating in a letter that, judging the case from the clinical aspect, he was convinced that it was one of psittacosis. I was able to confirm his clinical diagnosis by the experimental demonstration of the virus.

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[1] See The Lancet, 1935, i., 1207 and 1226.

The sputum, which contained much more mucus and saliva than pus, was emulsified in the tenfold amount of broth by thoroughly shaking with glass beads in a wide-mouth stoppered bottle. The unfiltered material killed one mouse injected intraperitoneally in two days with a pneumococcus of the group IV. The sputum emulsion was filtered through a rather tight sand and paper pulp filter. In view of the fact that the filtrate was nearly clear, it was not filtered further, and was injected intraperitoneally into two mice, one of which was reinoculated with the same amount (1·0 c.cm.) on the two following days. The mice died on the eighth and ninth days with a condition which is characteristic of the infection with a medium amount of virus (cf. THE LANCET, 1935, i., 1209). The virus was abundantly present in the masses of fibrin found in the abdominal cavity, in the perihepatitic and perisplenitic membranes, in the cells of the pericardial serofibrinous exudate, and somewhat less in the spleen. The virulence test, performed with the second subculture in a chicken-embryo medium, revealed the high virulence of the strain with a positive result up to the last titrated dilution of $0·5 \times 10^{-9}$ (dead on the 14th day).

It may be added that a budgerigar, which was found dead in the patient's house on June 3rd, had no signs of psittacosis and gave no positive result in the mouse test. On the other hand, the psittacosis virus was detected in one of four budgerigars purchased at random in the middle of June from a bird shop which supplied the patient's aviary.

FRACTURE OF THE RIBS IN WHOOPING-COUGH

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HON. PHYSICIAN TO THE HARROGATE AND DISTRICT GENERAL HOSPITAL

FRACTURE of the ribs during a paroxysm of whooping-cough is rare enough to deserve record.

Miss A., aged 18, a well-developed, apparently healthy normal girl, of the non-athletic type, began with a cough on May 24th, 1935. At the end of a week it became clear she was suffering from whooping-cough. On June 7th, during a paroxysm of coughing, she complained of acute pain over the left lower ribs posteriorly. On examination nothing definite was discovered, and the pain was thought to be due to muscular strain. A tight bandage to restrain the movement of the chest wall eased the pain considerably. A week later, on June 13th, during a violent fit of coughing, she felt a severe pain over the lower ribs behind on the right side, and said that she definitely heard a crack as though a bone had broken. On examination there was an area of acute tenderness over the eleventh rib on the right side, and crepitus could be felt on palpation and heard through the stethoscope.

The ribs were tightly bound with strapping which gave considerable relief to the pain. The following day an X ray photograph was taken which disclosed a fracture of the eleventh rib on the *left* side at the junction of the distal and middle third, accounting for the first attack of pain, and a fracture of the eleventh rib at a similar site on the *right* side corresponding to the second attack of pain. Firm strapping made the pain tolerable and the attack of whooping-cough, which was moderately though not excessively severe, ran a normal course of about seven weeks.

Inquiry into her previous history disclosed the fact that during birth she sustained a fracture of the thigh. Labour was prolonged and delivery difficult. At the age of 14 she had a fracture of the right forearm due to a fall in the gymnasium at school. She played the ordinary school games, though not strenuously, and encountered, presumably, the usual rough and tumble knocks without mishap. She has had no illness of any moment.

It was thought desirable to radiograph the bones of the extremities for evidence of deficient calcification. This was done by Dr. C. Hitchcock of Harrogate. The radiograms of the hands compared with those of a normal control of the same age show definitely less density in the bone shadows. The radius and ulna, the tarsal bones, and the tibia and fibula showed similar evidence of deficient calcification. In the epiphyseal ends of the radius at the wrist and to a less extent in the carpal bones and in the lower end of the tibia minute sharply defined points of dense sclerosis about 1 mm. in diameter can be seen. This condition is mentioned by some observers as being associated with fragility of the bones.

The patient has been put on a course of calcium and vitamin D, and it is intended to radiograph the bones again in six months' time.

REVIEWS AND NOTICES OF BOOKS

Diseases of Children

A Work for the Practising Physician. By Dr. M. PFAUNDLER, Professor of Children's Diseases and Director of the Children's Clinic at the University of Munich; and Dr. A. SCHLOSSMANN, Professor of Children's Diseases and Director of the Children's Clinic at the Medical Academy in Düsseldorf. English translation: American Editor-in-Chief, M. G. PETERMAN, Sc.B., A.M., M.D., Professor and Director, Department of Pediatrics, Marquette University Medical School. London: J. B. Lippincott Co. 1935. In five volumes. Pp. 544, 512, 689, 575, and 545. 9 gns. (5 vols.).

THE appearance of a new edition in English of Pfaundler and Schlossmann's standard system of pædiatrics is an event of first importance. Based on the fourth German edition, which appeared just before the death of Dr. Schlossmann, the present English translation has been carried out by 21 American pædiatricians, who have in some places added notes to the original work. This latter is itself widely representative, having been written by over sixty authorities, for the most part German, but including contributors from Austria, Holland, Finland, and America. A valuable feature is the section devoted to tropical diseases in childhood, written by Dr. Wyckerheld Bisdom of Java.

It would be difficult to over-estimate the influence that this work has had on physicians all over the world since the appearance of the first German edition in 1906. It was then largely the work of youthful pædiatricians, but set a standard of scholarship of which the most mature might be proud. With the passage of years, a number of contributors have resigned their association with the work, and others have taken their place; many of the original team, however, including both editors, took part in the production of the fourth edition, and the combination of freshness and maturity is a happy one. In the translation the original has been faithfully rendered into clear, if not always scholarly, English. Unfortunately, however, a few sections fall so far short of the general standard that they seriously mar the work as a whole; for example, that concerned with diseases of the organs of locomotion is in places almost unintelligible. "Here we deal with phenomena concerning more anatomical than clinical interests" it begins brightly, and continues a shade more solemnly "the heart muscle bellies protrude from the body surface like irregular spindle-shaped tumors. After a duration of many years exitus threatens from an intercurrent infection."

The work is divided into 5 volumes. Vol. I. opens with a history of pædiatrics by Prof. Brüning, which is followed by sections of a more general nature (biology, pathology, and morbidity of early life, examination of sick children, general prophylaxis, child welfare, and therapy), a consideration of nutrition and growth, and a discussion on the special pathology of different age-periods. In Vol. II. deficiency diseases and diseases of the blood, circulatory system, and endocrine glands are included; Vol. III. is devoted to infectious diseases and rheumatism; and Vol. IV. to diseases of the digestive and respiratory systems. Vol. V. comprises the diseases of the genito-urinary and nervous system, and of the motor apparatus, and includes an excellent index. This arrangement necessitates a certain amount of overlapping, but in a work of this nature this is an advantage, since the views of more than one authority are obtainable on different aspects of the same subject. The general production of the volumes is admirable. A heavy surfaced paper has been used, which has made possible the reproduction of radiograms in the text, and the numerous illustrations are well chosen and clear. The selective use of small type has kept the size of the volumes within reasonable limits. As a work of reference there is one great disadvantage to this system of pædiatrics: no exact references to the literature are given, although authors are quoted by name. In spite of this we commend the book as one of the most important and complete systems of pædiatrics obtainable.

Endoscopie et pleurolyse

By O. M. Mistal, médecin directeur de l'établissement Clovelly, Montana. Paris: Masson et Cie. 1935. Pp. 436. Fr.55

Beginning with an anatomical and histological description of adhesions, the author goes on to describe early attempts at their division by open operation. The following chapter on indications and contraindications of thoracoscopy should be one of the most important in the book if the author had not such an unfortunate craving for completeness that the reader can hardly see the wood for trees. Among the rarer indications for thoracoscopy he gives the confirmation of healing before letting out a pneumothorax; also the observation of the effect of drugs and rays on certain diseases of the lungs and pleura. The thoracoscopic appearances of two forms of syphilis of the pleura are described. The next chapter deals with the instruments used in thoracoscopy; this section contains 80 illustrations, and it is unlikely that any instrument of importance has been omitted. After a description of the anatomy of the pleural cavity, there follow details of the technique of the division of adhesions by cautery, by diathermy, and by a combination of the two. In considering the results of the operation, the writer finds that out of 65 thoracoscopic examinations, adhesions could be divided in 52 cases: 34 patients were improved, 13 stationary, and 5 worse. Perforation of the lung occurred in 3 cases (only 1 during the operation) and hæmorrhage also three times. Serious effusions were noted in 8 cases, slight ones in 34, only 7 cases escaping entirely.

Dr. Mistal describes a new application of thoracoscopy of his own invention. By means of a specially constructed quartz electrode, introduced through a sinus, the pleura may be irradiated with ultra-violet light. In a concluding paragraph he states that "the direct irradiation of the pleural cavity with ultra-violet rays, the introduction of various gases and drugs and of radium, following our own method, will probably have great therapeutic importance in the treatment of certain pulmonary affections." Perhaps they will; but one cannot help feeling that angels would fear to tread some of the paths Dr. Mistal traverses without a backward glance.

Heart Disease in the Tropics

By H. O. Gunewardene, M.B., B.S.Lond., D.M.R.E. Camb., late Clinical Assistant, National Heart Hospital, London; Consulting Cardiologist, Columbo, Ceylon. India: Butterworth and Co., Ltd. 1935. Pp. 101. 8s. 6*d*.

This book should interest others besides those whose work is in the tropics. Dr. Gunewardene believes that new lines of investigation may suggest themselves to those interested in heart disease from reading a description of, for example, such a condition as rheumatic heart disease as it manifests itself in an entirely different climate and setting. One of the most interesting chapters deals with cardiac disability as a result of ankylostoma infection which, according to the author, is comparable with rheumatic fever as a common cause of heart disease in the tropics. While studying this condition he was greatly impressed by the variety of murmurs which might develop during the course of the disease, and he was able to convince himself and others that not only systolic but also diastolic and presystolic murmurs might be heard, disappearing as the patient recovered. To illustrate these observations a full account of several cases is given. Apart from this a review is given of cardiovascular phenomena in tropical climates, and sections on rheumatic heart disease, diabetes, diphtheria, syphilis, and high blood pressure. The value of digitalis, oxygen, and potassium iodide is briefly discussed, and a short section on the effect of altitude on cardiovascular cases is included.

Inhalation Therapy Technique

By W. E. Collison. With Foreword by Sir Bruce Bruce-Porter, K.B.E., C.M.G. London: William Heinemann Ltd. 1935. Pp. 76. 5*s*.

Although beginning with a historical introduction describing early types of atomiser, this book is really an advertisement for the author's Apneu inhaler. This fact does not detract either from the well-known merits of the instrument described, or from the value of the information given. Major Collison's inhaler is mounted on an oxygen cylinder from which the gas can be made to pass through medicated solutions; the high pressure of the oxygen jet results in vaporisation into smaller particles than can be obtained by atomisers working with low pressures. The oxygen with its content of drugs in fine suspension is administered to the patient by means of a rubber bag and face mask, similar to those used for nitrous oxide anæsthesia. The apparatus is simple to use as it only requires a turn of the handle to give one or other of the atomised drugs or a mixture of the two. With another setting pure oxygen can be given.

After a clear description of the apparatus the writer proceeds to give some recommendations for its use in various affections of the respiratory tract. The preparations advised are given under such trade names as *apneugene and campheugene*, but the composition of each is given. Asthma, bronchitis and emphysema, bronchiectasis, pulmonary tuberculosis, laryngitis, and even the common cold has its appropriate inhalation. The last part of the book consists in extracts from articles in medical publications in which the apneu method has received favourable mention.

The medical profession has, undoubtedly, been backward in inhalation therapy, and even the ridiculously inefficient administration of oxygen through a glass funnel has not been altogether given up; in Major Collison's book readers will find useful information about an efficient method of inhalation.

What of the Child?

By Andrew Kefalas, M.A., M.B., Ch.B. London: William Heinemann Ltd. Pp. 187. 5s.

In the flood of books on children this little volume takes a useful place. The author describes the psychophysics of development and peculiar habits. He discusses the rôle of the parents in upbringing, in discipline, and in punishment. He describes the play activities of children, their daydreams, their fears and peculiarities of character. He also gives special attention to the important problem of puberty and adolescence, and the various social and personal anomalies which colour youthful development. He also has some sensible advice to give on sex instruction. The book as a whole is intelligent and sympathetic, and can be recommended not only to parents but to general practitioners who are awakening to the psychological aspects of child development.

Introduction to Pharmacology and Therapeutics

Fourth edition. By J. A. Gunn, M.A., M.D., D.Sc., F.R.C.P., Professor of Pharmacology in the University of Oxford and Fellow of Balliol College. London: Humphrey Milford, Oxford University Press. Pp. 237. 5s.

The fact that this handbook has reached its fourth edition within five years is a clear indication that there can be few students and teachers of medicine who are not aware of Prof. Gunn's valuable work. The book is intended to be read before the student attends lectures on pharmacology; but it provides such a comprehensive survey of the whole subject that it might well be read by anyone desiring to refresh his memory as to the principles underlying the art of healing. The new edition shows few changes, for little more than a year has elapsed since the third edition was published, and it can be warmly recommended as a sane, critical, and attractive account of the subject.

Electrocardiography

By Chauncey C. Maher, B.S., M.D., Assistant Professor of Medicine, North-Western University and the Montgomery Ward Medical Clinics. London: Baillière, Tindall and Cox. Pp. 250. 18s.

Dr. Maher's book has been written not for the cardiologist but for practitioners and for those who specialise in departments of medicine other than cardiology. Its aim is to enable them to correlate the electrocardiographic with the clinical findings. The two opening chapters deal with the clinical classification of heart disease and the arrhythmias, while in a short third chapter the author outlines the anatomy of the conducting system. Chapters 4 and 5 are devoted to technique and to a consideration of the features of normal records. From here onwards the author follows a uniform scheme. Each disorder of the heart's mechanism is illustrated first, by a drawing of the Purkinjé system to indicate the site of the lesion, secondly, by a diagrammatic electrocardiogram, and thirdly, by actual records. To each record is appended a tabulated analysis, the first part of which deals with the clinical and the second with the electrocardiographic diagnosis. This method makes it easy for the novice to interpret the records, but provides somewhat tedious reading for those readers who have some previous knowledge of the subject.

The chapter which appealed to us most was that dealing with axis deviation. This subject is illustrated by some excellent radiograms which enable the reader to compare the anatomical with the electrical axis of the heart in cases where the brunt of the lesion falls on the right and left ventricle respectively. It also illustrates well the range of normal variation in the electrical deviation associated with differences in the lie of the heart. The records are well chosen and clearly reproduced.

Encyclopedia of Veterinary Medicine, Surgery and Obstetrics

Second edition. By George H. Wooldridge, F.R.C.V.S., M.R.I.A., F.R. San. I. Professor of Medicine and Hygiene, Royal Veterinary College, London; Hon. Consulting Veterinary Surgeon to the Zoological Society, London. London: Humphrey Milford, Oxford University Press. In two vols. Pp. 1652. 6 gns.

This encyclopædia has been brought up to date, and some chapters, including those on actinomycosis, actinobacillosis, milk fever and braxy, have been rewritten. New chapters are supplied on lamb dysentery, swine influenza, spinal anæsthesia, surgical narcosis with avertin and nembutal, gland grafting, infection and immunity, and a veterinary pharmacopœia has been added. As regards arrangement, the first volume of 836 pages contains a section dealing with diseases caused by bacteria or filtrable viruses, the conditions being grouped according to the animal species; this system is not, however, adhered to, since the chapter in which contagious mastitis is discussed is to be found amongst surgical conditions. There follow sections which discuss protozoal, constitutional and local diseases. The second volume of 816 pages deals with surgery and obstetrics. Most of the chapters have been written by Prof. Wooldridge, but 48 other workers have contributed articles on subjects with which they are particularly familiar. Chapters on horse sickness, contagious bovine pleuropneumonia, bluetongue, swine fever, piroplasmosis, acariasis and mastitis deserve special mention; whilst the veterinary pharmacopœia and the chapter on infection and immunity are useful adjuncts to the new edition. Some aspects of veterinary medicine have received inadequate treatment: thus the whole subject of plant poisons is dealt with in only six pages, whilst with two or three exceptions all diseases of poultry are omitted.

In collecting and assembling a mass of scattered and unavailable information, Prof. Wooldridge has done a great service to the cause of animal health; and if this encyclopædia is amplified in certain places in future editions, the veterinary professor will find it almost indispensable.

THE LANCET

LONDON: SATURDAY, AUGUST 17, 1935

SPECIFIC CONTROL OF WHOOPING-COUGH

Like measles, whooping-cough is not generally notifiable, and our idea of its incidence must be based largely on estimates such as those of Stocks and Karn, quoted by Drs. Paterson, Bailey, and Waller in the paper which appears in our present issue. Our knowledge of the morbidity due to its complications is even less exact. The mortality, owing to the enduring nature of the illness, is probably understated to a lesser degree than that of measles, in which the deaths tend to be ascribed to the complications to the exclusion of the primary infection; indeed, the figures given by Dr. Stocks in his paper on p. 386 suggest that whooping-cough is sometimes blamed for deaths which are chiefly the result of influenza epidemics. But the fact remains that, though the public still looks on it lightly, this disease is now the most formidable of the acute specific infections of childhood.

The therapy is notoriously unsatisfactory. The new drugs proposed are legion. Vaunted for a time they are finally rejected in favour of the few well-tried but not always reliable sedatives prescribed by our predecessors. Although success for vaccine therapy has been claimed by some, most observers report results which are at best equivocal. Serum treatment is little more promising: Dr. Paterson and his collaborators note that Jundell seems to have secured some amelioration of the attack by means of the injection of reactivated adult-immune serum, but they themselves are unable to record any apparent improvement from the treatment of a series of cases with convalescent serum. Specific prophylaxis on the other hand arouses greater hope. The work of Madsen in Denmark and of Sauer in the United States of America is particularly well known, and opinion, if not unanimous, is much less divided over the value of vaccines in prophylaxis, provided they are prepared from fresh strains in the correct antigenic phase and injected in adequate doses at a sufficient interval before exposure. In recording the results of prophylactic injection of convalescent serum Paterson, Bailey, and Waller are rightly cautious in expressing an opinion about its value. Their series of 95 contacts with 55 controls is too small to have statistical significance, but the fact that 42 per cent. of the presumably infected contacts did not develop the disease, in comparison with only 11 per cent. of the controls, is a basis at least for further investigation, and this no doubt will be made.

In an attempt to determine whether a child had had an infection with the Bordet-Gengou bacillus on some previous occasion or whether vaccine prophylaxis in a non-infected child had been of any avail, Dr. Paterson and his co-workers have made use of a skin-test in four groups of children. An area of hyperæmia, about three-quarters of an inch across, appearing 24–48 hours after the intradermal injection of a minimal amount of vaccine was considered as positive and an indication of an allergic state following natural infection with, or vaccine prophylaxis against, the Bordet-Gengou bacillus. The utility of such a test, if its reliability can be confirmed, is obvious. The results recorded are peculiarly interesting, inasmuch as Siebler and Okrent[1] employing a similar test considered that hyperæmia indicated susceptibility and a negative reading immunity following vaccine prophylaxis—an interpretation exactly opposite to that of the present observers.

INDUSTRIAL MEDICINE IN FLUX

The organisation of industry is undergoing changes and developments that are both rapid and fundamental. In the course of comparatively few years it has had to cope with war, boom, depression, and a constant flow of new inventions. It is in a state of flux and he would be rash who would attempt to forecast the form of the next phase of stability. In the midst of this vital but restless period the study and practice of industrial hygiene and medicine have progressed if not in a spectacular yet in a very encouraging way. It has been impossible for the medical needs of industry to reach the stage of clear definition while industry itself is undergoing a phase of extensive internal change, but in spite of the fact that industrial medicine is still adolescent great strides have been taken. A stage has been reached where, given intelligent coöperation, the medical hazards of occupation can be countered and work made reasonably safe and congenial. It is useless to deny that this state of affairs is made easier of attainment where the unit of production is large, and whatever drawbacks there may be to so-called rationalisation ease and efficiency of medical supervision is not one of them. Centralised control of production is a powerful ally of industrial medicine. How far this tendency will spread is uncertain; meanwhile the vast majority of industrial concerns employ less than a hundred workers, and the problem of the medical supervision of these remains. A medical scheme does not work economically in units of less than a thousand workers and the alternative method of groups of small factories coöperating for medical services has unfortunately received practically *no trial*. It is something well worthy of experiment.

Many matters which call for medical supervision at work are not receiving, or are not capable of receiving, attention in any other way. These range from the proper selection of staff and the prevention and treatment of hazards and accidents to the equally important coöperation with private doctors over such things as return to work combined with treatment, and consultation over individual traits and circumstances that only become manifest in the patient's working environment. Our columns in the past few years have contained numerous contributions dealing with these matters, and future developments were considered at the recent congress of the Royal Sanitary Institute in Bournemouth, when a section of hygiene in industry collaborated with the Industrial Welfare Society. At this congress Dr. T. E. A. STOWELL emphasised the foundations common to all medical services in industry; no matter what the needs of a special concern might be there is an A.B.C. of industrial hygiene without which nothing can succeed. Dr. W. D. JENKINS outlined the opportunities and duties that exist for employers to help and care for their older workmen. Important now this is a side that will gain in importance if the average age of the population continues to rise and the proportion of older people to increase. Even after they have left industry these older people can be useful citizens and it is a social duty to see that in their later years their work does not unnecessarily impair their powers of happy and useful life. The distribution of goods is undergoing rapid changes and not the least of these is that more people are being employed in what may be called the ancillary services of production. Though not strictly industrial the work of the sales-shop and store is organised on lines which call for medical supervision difficult to apply except in large single establishments. Dr. M. L. DOBBIE-BATEMAN dealt with the shop assistant and the meeting was notable for the emphasis laid on the medical problems of retail selling. Working with a large retail staff, albeit under the ideal condition of having them almost under one roof, Dr. DOBBIE-BATEMAN has utilised her opportunities to collect information about an occupation which in general is scattered in small units but which nevertheless calls for as much medical attention as the ordinary run of factory work. Lord TRENT, who presided over the section, was able to draw on his own administrative experience and stated frankly that the picture of the life of a shop-assistant in big cities can be an unpleasant one unless the employer is expertly advised and takes medical considerations into account in a fair and sympathetic manner.

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[1] Siebler, K., and Okrent, S.: Jour. of Pediat., 1934, iv., 188; see THE LANCET, 1934, ii., 877.

The boundaries of occupational medicine are thus widening from mines and factories to offices and shops—from mere hazards to the deeper, more intimate and individual psychological maladjustments of the worker. That this extension could under improper administration result in victimisation is obvious, but the phase of suspicion is dying down as industrial medical officers continue to prove that they are doctors to their patients before they are servants to anyone, and they are gradually widening their own function to embrace those wider economic interests which are so potent in the making or breaking of the health of individual workers. Lord TRENT showed a deep understanding of this social aspect of medicine when he stated that "the removal of that perpetual fear of losing one's job which besets working people of all ages [is] the greatest human problem that will have to be solved in the course of this century." The acknowledgment that economics and medicine are inextricably interwoven is at once the justification for industrial medicine and its greatest urge to progressive and far-seeing development. The medical profession as a whole has a deep concern in the trends of industrial and economic organisation because while a movement, such as for instance large-scale grouping, may bring forward new problems it also produces new opportunities; and who will deny that in a complex world centralisation is essential if we would remain sane and that through coöperative effort preventive medicine is made easier and treatment more comprehensive and efficient? Industrial medicine will develop not with the object of increasing sectional profits but because an industrial state cannot afford to leave untilled a most fruitful and economically efficient field of preventive and curative medicine.

TRAINING THE SQUINTING EYE

THE interest now taken in the treatment of squint, whether with or without operation, shows no signs of abating. Miss DOBSON's most recent contribution to the subject[1] will be found of great practical use. She describes a device for the use of children whose concomitant squint has already been overcome, or nearly so, either by the wearing of glasses or by other methods, but in whom one eye remains to a greater or less extent amblyopic from disuse. Suppression of the image in a squinting eye is the great obstacle to successful orthoptic treatment. Hitherto complete occlusion of the non-squinting eye has been the favourite method for developing vision in a squinting one, and in the case of young children with constant monolateral squint it is often the only practicable one. The ideal method of occlusion, which admits of some indirect vision on the temporal side of the field but completely shuts off direct vision, was set out in our columns (July 27th, p. 183) by Mrs. THORNETT-JOHNSON, but she admits that for any child after the age of six with vision in the squinting eye reduced to much below 6/60 it is a very trying and long treatment. For older children, although it may be possible, unless the vision of the squinting eye has improved considerably beyond 6/60 it must necessarily be a serious handicap to education. In Mrs. THORNETT-JOHNSON's experience the average time taken at a clinic to restore the vision of a squinting eye seeing less than 6/60 to normal has been 18 months, the shortest being 6 months and the longest 3 years. Any method of quickening the pace would be welcome. When the child is able to read, when the squint is only slight or occasional, and when the vision of the squinting eye is good enough, with refraction corrected, to read large print by itself, it is easier to overcome the remaining amblyopia by employing it in harness with the good eye; and in this way there is then not only the urge to interpret the image that falls upon the retina of the squinting eye but also the stimulus of binocular vision.

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[1] The Amblyopia Reader: A System of Eye-sight Development. With foreword and notes by Margaret Dobson, M.D. London: Rembrandt Photogravure Ltd. Pp. 93. 15s.

Many varieties of apparatus are in vogue to effect this object. One of the most successful is the cheiroscope (or eye awakener) of Maddox. Various forms of "amblyoscope" and "kinetic stereoscope" and the complicated (and necessarily expensive) "synoptophore" are in use for this purpose. There is room for a simpler and less expensive method of effecting the required object and one which may be used at home. Miss Dobson's method is ingenious. She has had a number of nursery rhymes and simple stories printed with certain words and pictures half in black and half in orange. The vision of the two eyes of the child having been made approximately equal, if necessary by means of a Chavasse glass before the good eye, a ruby red shield is also placed before that eye so that the halves of the words or pictures printed in orange are completely obliterated, but so that the amblyopic eye with its refraction corrected can see the whole of each word, the size of the print being graded according to the degree of the amblyopia. In this way the help of the good eye is called in to assist in the development of the sight of the bad one. The idea is a good one and will, we anticipate, be extensively used. Anyone proposing to undertake the non-operative treatment of squint in children would do well to inspect the methods in use at existing clinics before purchasing expensive apparatus. Apart from apparatus a large amount of both patience and tact are required for success.

CLEARING THE TUBES IN ASTHMA

In a large proportion of patients with asthma the respiratory tract is unhealthy. The nasal mucosa is swollen, the ostia of the sinuses are blocked, and bacteria flourish in the stagnant secretions. There is a persistent low-grade bronchitis and the mucous plugs expectorated from the smallest bronchioles contain leucocytes and bacteria; the latter often in almost pure culture. Acute episodes such as sinusitis, hæmoptysis, pleurisy, and pneumonia are abnormally common. The pulmonary lesions, like those in the nose, must often be secondary to hypersecretion of mucus and œdema of the epithelium, which block the small bronchioles and favour stagnation and infection. Exceptionally, the secretion of mucus may be so great as to obstruct the whole bronchial tree and cause death from asphyxia, as in a case reported by Brulé and others.[1] A less uncommon accident is massive collapse from obstruction of a single main bronchus. In theory, the unhealthy state of the respiratory tract may be regarded as a result of asthma, but in practice it is known to be an important factor in the perpetuation of the disease. Methods to restore a healthier state of the respiratory system are therefore an important part in the treatment of asthma, and in this country the Asthma Research Council has emphasised the value of respiratory exercises which empty the bronchi and deflate the lungs. Shambaugh and Alter[2] in America report good results in fifty cases of bronchial asthma from a regimen based on elimination by postural drainage of the accompanying bronchial and pulmonary exudate. The patient kneels on a chair or stool with his hands on the floor, and coughs as nearly continuously as possible, until the bronchi have been completely emptied. The treatment is carried out twice a day, for a minimum of three minutes, and any coughing between is regarded as a sign that insufficient evacuation has been accomplished. A simple saline mixture given before each treatment may loosen the secretion and render its evacuation easier. The manœuvre is reminiscent of the late Dr. Tucker Wise's postural method[3] of treating phthisis designed to promote drainage of the bronchial tree. He encouraged his patients to lie for half an hour three times a day on an inclined plane with the head lower than the hips, and the gratifying results he obtained were no doubt due to the relief afforded by the maintenance of a free airway.

It is rather unusual to give treatment by inoculation to young children in this country, but Haibe,[4] director of the Bacteriological Institute at Namur, considers it very important to treat asthma vigorously as early as possible before permanent damage has been done. He claims a 90 per cent. recovery-rate in young children with asthma after treatment by the application of antivirus to the nose, and the subcutaneous injection of autogenous vaccines made from sputum. The antivirus was a stock preparation made from a variety of organisms isolated from patients with asthma. When the patient was too young to bring up sputum, material for the preparation of the vaccine was made from swabs from the larynx. In this country we may not be so sanguine about the action of antivirus as our French contemporaries, but in any effort to clear the respiratory system the nasal passages should not be neglected, and the use of nasal sprays or the displacement technique of Proetz should be remembered.

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[1] Brulé, M., Hillemand, P., Delarue, J., and Netter, A.: Bull. et mém. Soc. méd. hôp. de Paris, June 10th, 1935, p. 981.

[2] Shambaugh, N. F., and Alter, S. M.: Science, Feb. 22nd, 1935, p. 210.

[3] The Lancet, 1908, i., 1546.

[4] Haibe, A.: Scalpel, July 20th, 1935, p. 889.

The Medical Research Council have appointed Prof. J. A. Nixon, C.M.G., M.D., F.R.C.P., and Dr. R. E. Lane, M.R.C.P., to fill vacancies in the membership of their Industrial Health Research Board.

INDEX TO "THE LANCET," VOL. I., 1935

The Index and Title-page of Vol. I., 1935, which was completed with the issue of June 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of The Lancet, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

ANNOTATIONS

LIFE WITHOUT BREATHING

Singh reports [1] that a dog has been kept alive for 16 minutes without breathing oxygen through the lungs; it was supplied with oxygen intravenously while under an increased atmospheric pressure amounting to three atmospheres. This crucial experiment was ended abruptly by pulmonary embolism, the result of a fault in the injecting apparatus which allowed a sudden gush of oxygen into the veins. Otherwise there seems no reason why it should not have continued much longer; and herein may lie the germ of an important advance in oxygen therapy. Previous workers have injected oxygen into the veins, but in human subjects there is known to be a grave risk of pulmonary embolism if the rate of injection exceeds about 0·75 c.cm. per kg. of body-weight per minute. While it has been suggested that small quantities given at intervals might provide useful means of oxygen administration, this method has not so far been scientifically justifiable in the treatment of anoxæmia. Singh has investigated its possibilities in two stages. First he determined the dose of oxygen that could be absorbed intravenously under ordinary atmospheric pressure. He found that cats could absorb about 5 c.cm. of oxygen injected in about ten minutes, and that other animals of different species could take larger doses in relation to their weight. The amount of gas absorbed depends on various factors including the distance between the point of injection and the heart and lungs, and the calibre of the veins along which the bubbles travel. But it was clear from the experiments that, owing to the limitations imposed by the calibre of the available veins and the rate at which the oxygen can be carried away, injection at ordinary atmospheric pressure can supply only a comparatively small proportion of an animal's oxygen requirements. Singh therefore proceeded to repeat his observations within the pressure chamber at the premises of Siebe, Gorman and Co. At an increase of one atmosphere it proved possible to inject intravenously 30–40 per cent. of the oxygen required by a cat without any harmful effects, and at two atmospheres about two-thirds of the oxygen required by a dog was introduced. The crucial experiment, as already stated, showed that at a pressure of three atmospheres the whole of a dog's oxygen requirements could be met by intravenous injection. It was, of course, necessary for the complete experiment to be performed in the pressure chamber, and the operator had himself to work there. During the injection the dog's respiration was almost normal; a soda-lime tube attached to the trachea, and leading to a rubber bag absorbed the expired carbon dioxide.

The theoretical likelihood that under positive pressure enough oxygen can be injected to meet all the needs of an animal has thus been justified in fact. The application of this finding to problems of chest surgery, resuscitation, and the relief of anoxæmia is the next, and obviously very difficult, step. An alternative route for the supply of oxygen when large areas of normal aerating surfaces of the lungs are put out of action by, for example, a diffuse broncho-pneumonia would get over difficulties at present insurmountable (except in milder cases where the oxygen-tent is very useful). Injection of the gas, if it proves practicable, should be a valuable means of coping with respiratory failure of this type.

AIRCRAFT AND YELLOW FEVER

THE risk of yellow fever spreading to parts of the world at present immune from this disease has been much increased in recent years by the development of aerial transport, and public health authorities are everywhere becoming alive to the danger. One side to the problem of diminishing this risk consists in preventing the transport of the mosquito vector, *Aedes ægypti*. In a communication in the monthly bulletin of the Office International d'Hygiène Publique for July, Dr. C. L. Williams and Dr. W. C. Dreesson, of the United States public health service, confine themselves to this aspect of the subject. They dismiss as impracticable the frequent fumigation of aircraft with hydrogen cyanide; fumigation with "carboxide" (ethylene oxide and carbon dioxide) they find not to be satisfactory on account of the great weight of necessary apparatus and the high concentration of this gas required to kill mosquitoes; and they finally recommend a concentrated extract of pyrethrum (2 per cent. of pyrethrin in light oil) distributed by an atomiser in a very fine cloud at the rate of 2 to 4 grammes per 1000 cubic feet. That such a method, applied with care and conscience, should destroy all the mosquitoes on board there is no reason to doubt. But that such a method should be necessary at all is a sorry reflection on the state of the sanitary organisation at the aerodromes in question. To free the native quarter of a city from *Aedes ægypti*, or to control it completely in a seaport full of small craft and lighters, is admittedly not an easy matter. But there is no reason whatever why a well-planned aerodrome with an efficient sanitary gang should produce a single specimen of this purely domestic mosquito.

AVOIDANCE OF REACTIONS AND FAILURES IN DIPHTHERIA IMMUNISATION

ACTIVE immunisation against diphtheria, when carried out in residential institutions, implies, or should imply, preliminary Schick tests. In clinics, however, practical considerations may compel the omission of the test or impose a single reading which is usually made a week after its performance. In either event the medical officer is deprived of the evidence of protein sensitivity afforded by the appearance of the transient pseudo-element. A pseudo-positive reactor to the test is likely to be a reactor to the prophylactic, the dosage of which may be modified accordingly. To provide an *indicator of sensitivity to protein* contained in the prophylactic the Moloney test, the *intradermal* injection of a minute dose of diluted toxoid, has been used upon a large scale in Canada and advocated in this country. Dr. Chesney [1] considers that this test, although desirable, is a troublesome procedure in practice; and it is one which, it may be added, Swyer [2] found *to be not* an accurate index either of the *liability to, or severity* of, the reactions to be expected after the injection of formol-toxoid in the case of young adults. Further evidence as to the reliability of the test in children will doubtless be forthcoming, but Chesney prefers to employ what he terms the "detector dose," a preliminary dose of formol-toxoid injected *subcutaneously*. Several batches of toxoid of varying but high antigenic value (but of different origin and dosage to the toxoid used by Swyer) were employed by Chesney in the immunisation of over 700 children. For children up to fourteen years of age a preliminary detector dose of 0·2 c.cm. of toxoid was injected; this was reduced to 0·1 c.cm. for those over fourteen. Usually no local redness or tenderness followed the injection of 0·2 c.cm. of formol toxoid; occasionally an area of redness 1–2 cm. across resulted and rarely one of 2–5 cm. After the detector dose, which "contains 200 times the amount of toxoid used for the Moloney test and in itself acts as a primary stimulus," two doses of the prophylactic were injected subcutaneously at fortnightly intervals. Non-reactors received, presumably, two full doses of 1 c.cm. of toxoid; slight reactors, 0·4 c.cm. and 0·6 c.cm.; but the particularly sensitive were injected with toxoid-antitoxin floccules (T.A.F.). Among a group of 332 children only 10 reacted to the detector dose to such a degree as to make it desirable to change to this preparation, which is of high antigenic value and causes but few and slight reactions even in adults.

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[1] Singh, I.: Jour. of Physiol., 1935, lxxxiv., 315.

[1] Chesney, G.: Ann. Report M.O.H. Borough of Poole, 1934, p. 15.

[2] Swyer, R.: THE LANCET, July 6th, 1935, p. 22.

Chesney now uses a formol-toxoid of 58 Lf. per c.cm. in a routine dosage of 0·6 c.cm. and 1 c.cm. at fortnightly intervals following the detector dose. He states that the number of Lf. units in this course of injections is "in excess of that contained in three 1 c.cm. doses of the formol-toxoid generally used in this country." Reaction to the dose of 0·6 c.cm. is followed by a dose of the same magnitude instead of the full final dose of 1 c.cm. The proportion of Schick-immunes produced by this method and this prophylactic appears to be very satisfactory, immunity to Schick-negative level being attained in more than 90 per cent. in a few weeks. Chesney thinks that the occurrence of clinical diphtheria, caused by the gravis strain or a heavy infection with a milder strain in a few persons who had previously been immunised and found to be Schick-immune to the ordinary test, suggests that the level of immunity thus indicated may not be sufficiently high. He has therefore made some observations with a more potent Schick toxin supplied by Dr. R. A. O'Brien. This preparation, although containing no more free toxin than the standard fluid, had four times its combining power, owing to the presence of "toxoided" toxin. Tests with the two preparations were made simultaneously upon a group of 45 children who had received a course of formol-toxoid. In 5 cases (11·1 per cent.) the readings were positive to the fourfold test: of these, 4 were negative to the standard test and 1 was positive. The remaining 40 children were negative to both tests. From the results in this small series Chesney draws the rather sweeping conclusion that "in every hundred children in his area treated with the prophylactic course, there are two or three who fail to develop immunity of the level indicated by the standard Schick [test] and a further nine who are not satisfactorily immune in spite of their negative reading to the standard Schick test, and that this 9 per cent. are the Schick negative children whose 'Schick immunity' will break down before a heavy or markedly virulent infection."

It would have been interesting and possibly instructive if this group of 5 children had been tested again with the fourfold Schick toxin a week later. It may be suggested that some at least who were at first positive to the fourfold test would, as the result of the secondary stimulus thereby provided, have become negative reactors. Whether the secondary stimulus of Glenny be Schick toxin or the diphtheria bacillus itself, its effect

SYPHILITIC AORTITIS

It has been suggested in Germany that syphilitic aortitis is alarmingly on the increase, and Dr. C. Müller,[1] of Oslo, has been studying the post-mortem records of the Ullevaal communal hospital to see whether the German conclusions are applicable to Norway. His material covers the period 1905–33, and consists of 14,258 autopsies, at 455 of which syphilitic aortitis was found (3·2 per cent. of all the examinations). Though there was a large increase in the annual number of such cases during the 27-year period under review, this is fully accounted for by the increase in population, and Dr. Müller suspects that the German findings merely reflect a change of fashion in diagnosis and nomenclature. Of 244 Norwegian cases of syphilitic aortitis diagnosed as such post mortem between 1920 and 1931, about two-thirds were complicated by such conditions as aortic insufficiency and aneurysm. The correct diagnosis was made clinically in only 36 per cent., the complicated cases being recognised in 51 per cent., and the uncomplicated in only 6 per cent. These are figures disconcerting to even the most hardened clinician, and Müller indulges in calculations showing how many of the diagnostic oversights could have been avoided by systematic examination of the patient. In only 50 of the 244 cases had an attempt been made to obtain a history of syphilis; and only in 62 per cent. had the Wassermann reaction been tested. Other serological tests might also have been exploited more fully, although some 20 per cent. of the cases under review proved to be sero-negative. Müller also pleads for the more general and regular use of X rays, and a more comprehensive study of the clinical picture. It is not enough to rely on a diastolic murmur over the heart, for this was observed in only two-thirds of his cases of aortic insufficiency; a systolic murmur is, in his experience, at least as common as a diastolic murmur in such cases. The patients with neurosyphilis in his post-mortem material died comparatively early, presumably because syphilis of the nervous system runs a more rapid course than syphilis of the aorta, the prognosis of which is not altogether desperate. Indeed, less than half of the Ullevaal patients suffering from syphilitic aortitis died of disease of the heart or aorta. The average age at death was between 56 and 57, and over 12 per cent. of all the patients were more than 71 years old. There was even a handful of octogenarians among them. Aneurysms proved less fatal than might have been anticipated, for only 19 per cent. of their owners died from rupture of the aneurysm or pressure exerted by it on the surrounding structures.

SHIVERING

Some interesting experiments on shivering are reported [2] from the National Hospital, Queen-square, comprising observations both on normal persons and on patients with selected nervous lesions. The condition was produced by immersing the legs first in a warm and then in a cold bath, rectal and skin temperatures being recorded meanwhile from thermocouples suitably placed. The thermocouple in the rectum was 5 cm. from the sphincter, and almost certainly gave the blood temperature. This fluctuated surprisingly, rising by about ½° during the warm bath and falling about 1½° during the cold. In the normal subjects shivering started shortly after the change of bath and stopped after a change in the reverse direction.

Although the long latent period—three minutes or so in each case—was against a reflex originating in the skin, there was nothing definite in the records to exclude this. Their most striking feature, nevertheless, was the close association of onset and cessation of shivering with the peak and trough of blood temperature respectively, suggesting that a change in this temperature was the effective agent. This theory was confirmed by the case of the paraplegic patient who showed similar changes in blood temperature and similar shivering reactions, but in whom reflex effects were excluded by the fact of the stimulus being confined to the legs, innervated from below the lesion, and the shivering to the upper parts of the body, innervated from above the lesion. Afferent stimuli were further eliminated by the observation that a patient with a lesion of one thalamus and corresponding loss of sensation from the opposite half of the body responded in the same way as a normal person. There is therefore little doubt that shivering, or its cessation, is the result of a change in blood temperature, although the actual level at which this takes place seems to be of minor importance. The efferent path of the motor impulses must start from a localised part of the central nervous system, for if the change in blood temperature acted on all the spinal segments shivering would take place below the level of a transverse lesion—which, as we have seen, does not happen. The origin of the impulses has not been located, but there is evidence that they are transmitted by the extrapyramidal tracts of the spinal cord, shivering having been found absent in one patient below the level of an operative section of the spinothalamic tracts; the actual spinothalamic lesion could not produce this effect, there was no evidence of involvement of the pyramidal tracts, and other cases (hemiplegic) had shown that shivering could occur, apparently normally, after considerable damage to them. This impression as to the extrapyramidal nature of the impulses was strengthened by the finding that damage to the cerebellum had a distinct influence on shivering, converting the ordinary clonic movements into choreiform movements. The investigators point out that shivering occurs from other causes, such as emotion and fever, and we hope they will extend their studies to these conditions.

ADHESIVE STRAPPING AND THE PATCH-TEST

It is unfortunate that so useful a preparation as adhesive strapping is often the cause of an irritation dermatitis; and as a rule the more efficient the strapping the greater the risk of dermatitis, elastic adhesive strappings sometimes giving an incidence as high as 25 per cent. Much of this dermatitis is mechanical in origin, arising from the tackiness of the application, and is comparable with the eruptions provoked in bakers by the sticking of dough to the skin. This type of dermatitis from adhesive plaster is not serious and readily subsides under suitable and simple treatment. A few cases, however, are traceable to an allergic sensitiveness towards one or other of the ingredients of the plaster, and this is more awkward, since limited contact may give rise to acute and distressing lesions which may persist for weeks. Schwartz and Peck [1] have investigated this problem by patch-testing over a hundred employees engaged in the manufacture of adhesive tape. They find that the resins employed are common causes of allergic dermatitis—all of 13 cases showing the condition were resin-sensitive—and that rubber is an occasional cause. This has been recognised by manufacturers, but efforts to find a non-irritating resin have not yet proved successful. In employing adhesive strapping for ordinary patch-tests one must bear in mind the possibility that the strapping itself may cause irritation and so obscure the results.

Elastic adhesive plasters probably find their greatest use in treatment of gravitational affections of the legs, but recent writings suggest a tendency to abandon the valuable technique evolved by Dickson Wright,[2] partly because dermatitis is a common sequel. This hazard can usually be avoided however by some simple expedient such as the application of the bandage over a protective covering like lint, gauze, cotton stockings, or zinc-gelatin paste. Another simple method, which can always be adopted in making patch-tests and is often suitable for legs, is the application of the elastic bandage reversed so that it does not adhere to the skin but to itself.[3]

The patch-test is now a routine examination for specific skin sensitiveness but not all workers subscribe to the same technique, and it seems desirable that standard conditions should be observed to allow a fair comparison of results. Enough work has been done to show that patients actually suffering from a sensitisation dermatitis will react immediately to a patch-test with the causative agent. Those who are not actually suffering from a dermatitis but are being tested for possible sensitiveness may show a reaction delayed not only for 24–48 hours, as often supposed, but for as long as 14 or even 24 days.[4] [5] This means that observation should be continued at least a month after routine investigations such as those described by Schwartz and Peck. Further, the patch-test is meant to demonstrate *allergic* sensitiveness and only a limited contact should be necessary to provoke such a reaction. The usual 24-hour application is if anything on the generous side, and has indeed been known to produce a simple traumatic reaction which tends to confuse the issue. It should certainly not be necessary, and seems undesirable, to leave patch-tests in place for 48 hours as suggested by these writers and by others recently.[6] For the same reason it is questionable whether a covering of gutta-percha or oil-silk over the patch-test is an advantage.

MALARIA AND HOOKWORM

As one of the lessening number of those who saw the early stages in the fight for the prevention of malaria, Sir Malcolm Watson has put on record [7] something of what has come within his own knowledge and experience during a time when, so he puts it, the spirit of high adventure filled the veins of medical men of many races. The opening of the story is taken up by an account of his noted attack on malaria at Klang and Port Swettenham in 1901, the fight seeming to be almost without hope in view of the high temperature, the rainfall of 100 inches a year, and the amount of swamp and tropical vegetation round them. So much was this the case that the High Commissioner had wired ordering that the work in the port should come to a stop, a decision which Sir Malcolm was happily able to have put on one side. The proof of the value of his public health work there, judged by the touchstones of hospital and laboratory, was seen between 1901 and 1905 in a fall to one-eighth in the deaths from fever and to one-third in those from other diseases. This last effect was completely unlooked for and a special point is made of it, but the parallel outcome in the case of hookworm infection will come to mind. Sir Malcolm put to Wickliffe Rose of the Rockefeller Foundation the suggestion that too much was being made of the hookworm in the tropics—seeing that in his experience 50 worms, the number usually present at post-mortem in Malaya, did no damage to the man who harboured them—and that the pushing of a campaign against this infection at the same time as one against malaria would be too much for the Malayan mind; and he then notes a finding from the Report of the Uncinariasis Commission to the Orient[8] that fewer than 100 hookworms did no damage to the infected person. It is true that in a group from a penal institution this was so, but the report says clearly that in the kampongs there was "a progressive fall in hæmoglobin values from the 100-worm group to the 0-worm group." The other side of the question is seen in the American experience in Bilibid prison after Manila had been taken from Spain; its death-rate could not be reduced below 7·5 per cent. till they got rid of the hookworms and other intestinal parasites, which the prisoners harboured; after that there was a fall to 1:35 per cent. Moreover, from Clayton Lane's recent review in our columns[9] it is clear that even to-day there is no knowledge of the lowest weight of hookworms under which man is undamaged, though he believes it is certainly under 50. When malaria and hookworm are both present in any country, only those in authority on the spot have the knowledge necessary for the giving of a decision as to which should be attacked first. But the second danger is still there and must be kept in mind.

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[1] Schwartz, L., and Peck, S. M.: Pub. Health Rep., U.S.A., June 14th, 1935, p. 811.

[2] Wright, A. D.: THE LANCET, 1931, i., 457.

[3] Ingram, J. T.: Brit. Med. Jour., 1935, i., 1126.

[4] Sulzberger, M. B., and Wise, F.: Arch. Derm. and Syph., 1931, xxiii., 519.

[5] Ingram, J. T.: Brit. Jour. Derm. and Syph., 1932, xliv., 422.

[6] Graham-Little, Sir E.: Brit. Med. Jour., July 20, 1935, p. 107.

[7] Some Pages from the History of the Prevention of Malaria. The Finlayson lecture for 1934 delivered before the Royal Faculty of Physicians and Surgeons, Glasgow. Glasg. Med. Jour., 1935, cxxiii., 49, 130, 202.

As its title tells, most of Sir Malcolm's lecture is a discussion, and a very useful one, of the history of the control of malaria in different parts of the world by biological methods, and by the production of delicate chemical changes in environment. It contains word-pictures of Gorgas and Darling, recounts the founding of the Ross Institute and its incorporation in the London School of Hygiene and Tropical Medicine, and comes to an end with a note on Ross himself, and a statement of the belief that in his last years he felt that the world was taking advantage of his discovery and that he had not toiled and fought in vain.

THE CHARAKA CLUB

It is four or five years since a volume of the Transactions of that admirable literary society, the Charaka Club,[10] has appeared. They have always been a delightful medley of wit and wisdom, and those who are fortunate enough to possess the previous issues will be delighted to find that the literary vitality of the club is admirably preserved. The contents of the volume, as of its predecessors, are extremely varied, and of these the following may be mentioned as examples: Dr. S. W. Lambert supplies a learned reading from Vesalius, with facsimiles of the second printed edition and many illustrations. Dr. G. L. Walton has an essay on composition with the camera, admirable photographs explaining how an inside knowledge of photographic technique may assist the intensive study of pictures. Dr. Francis Packard introduces us to the earliest surgical case book of the Pennsylvania Hospital. The institution was among the first, or the first, that was founded as a hospital in the modern sense of the term, but it was not till some 50 years after its foundation that the management ordered that any records should be kept, and the original case reports run from 1803 for the next 25 years. The operations recorded are not those of the present day, mainly being amputations in the treatment of fractures and dislocations. Among the drawings at the end of the book are two representing the case of a double hare-lip before and after operation; the operation was performed by a Dr. Physik (his real name), and the results seem to have been good. Dr. Archibald Malloch writes on James de Berty Trudeau, artist, soldier, and physician, giving illustrations of his statuettes and bas-reliefs in bronze, some of them being piquant caricatures. Those who have the whole series of the Transactions will note with regret that they are reading the last contributions of Prof. George David Stuart, surgeon, wit, and accomplished poet. In a sympathetic chapter Mr. Bernard Sachs reminds us of his great personal and intellectual qualities, and his friends will endorse the tribute.

IS ENDOCARDITIS LENTA ALWAYS FATAL?

Endocarditis lenta (subacute bacterial endocarditis), though not a common disease, is relatively important, since it usually strikes young adults and, as many believe, is always fatal in the end. The fact remains that isolated cures are often reported, and one authority (Libman) even reports a recovery-rate of about 3 per cent. The possibility of applying effective treatment has lately been discussed by H. Schulten,[1] who points out that although endocarditis lenta is due to an infection of a heart valve by the *Streptococcus viridans*—or rarely some other organism—there are occasional cases, clinically very similar, in which blood culture is negative, and no bacteria can be found in the endocardial vegetations post-mortem. Possibly the cause here is acute rheumatism, but whether or not this is so the recovery of such a case could not, Schulten thinks, be classed as a cure of endocarditis lenta; he seems to regard a positive blood culture as essential to diagnosis. Evidence of long-standing disease or congenital defect of the valves is also held as a rule to be a sine qua non, but it is believed that very exceptionally these may be absent—e.g., in endocarditis of the heart wall—or very slight. Schulten draws attention to another important feature of subacute bacterial endocarditis which may lead to a false idea of its curability—namely, the long remissions. It is now known that temporary improvement may be so great that the patient is able to resume his ordinary work, perhaps for several months; but almost without exception it is sooner or later followed by relapse and death. Treatment is divided by Schulten into two groups: (1) causal, which includes chemo- and sero-therapy, immuno-transfusion, vaccines, protein shock, and the surgical treatment of the presumed primary focus; and (2) symptomatic, including treatment for anæmia, the circulatory system, and antipyretic measures. In 23 of his own cases where a variety of these remedies were used, the patient always died. Replies to a questionnaire sent to his colleagues elicited a somewhat unusual result—namely, complete agreement on nearly all points. The general opinion was that an optimistic prognosis depended on a false diagnosis; that the mortality with or without treatment is 100 per cent., and that no therapeutic measure so far tried can alter the course of the disease. Two observers (Bingold and Lechleitner) make the suggestion that in the very early mild stage it may be amenable to treatment, but they offer no evidence in support of this belief. In short, the current opinion in Germany seems to be that the present measures used against endocarditis lenta are futile; and an important therapeutic problem remains wholly unsolved.

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[8] Rockefeller Foundation, Internat. Health Board. Publ. No. 9. 1920.

[9] THE LANCET, 1935, i., 1459.

[10] Proceedings of the Charaka Club. Vol. viii.

INJURIES OF THE CRUCIATE LIGAMENTS

IT is commonly assumed that the severest degrees of internal derangement of the knee-joint are those associated with rupture of the cruciate ligaments, partial or complete. These ligaments are so strong and their attachments so firm that there is reason to regard them as the main means of maintaining the stability of the joint. Superficial observation of the arrangement of the fibres would lead one to suppose that the anterior cruciate limits forward movement of the tibia on the femur, while the posterior limits backward displacement. Dr. Henry Milch,[1] of New York, however, thinks this a very imperfect view of the function of the cruciate ligaments. He holds that with the knee in full extension they have very little to do with stability, the collateral ligaments and the muscles being alone responsible. In flexion the action of the cruciates comes into play, some fibres of both anterior and posterior ligaments limiting backward and forward displacements on one another of the opposing surfaces of tibia and femur. Milch's observations on the results of rupture of the anterior ligament lead him to regard it as a structure of no very great importance. He has operated in cases of complete rupture of the ligament and has gone so far as to excise it completely, and he reports that its complete loss is compatible with relatively normal function of the knee-joint. Rupture of the posterior cruciate ligament is even less common, and he makes no definite pronouncement about its importance; but one gathers that he suspects this of being no greater.

The signs of rupture of the cruciate ligaments are said to be: (1) the possibility of passive displacement backwards of the tibia, or of its internal rotation, with the knee-joint in the position of extension; and (2) the possibility of displacing the tibia forward when the knee is flexed and the foot fixed. Of the first of these tests Milch says that it will never be positive if the collateral ligaments are intact; properly, therefore, it should be considered a test for injury of the collateral—more particularly the internal collateral—ligaments. The second test is reliable, he agrees, when present; but he found it positive in only 1 case out of 8. The probable explanation is that the tone of the quadriceps muscle is usually sufficient to mask the instability on which the test depends; under anæsthesia the muscle relaxes, and the "rocking" of the flexed knee-joint may then be demonstrated. The difficulty of distinguishing between injury of the cruciate ligaments and of the semilunar cartilages is shown by the number of times open operation has first revealed the lesion of the former. A tear of the internal meniscus may indeed be associated with rupture of the anterior cruciate ligament, and in one such case Milch excised both structures, with the result that on discharge from hospital the patient had a knee-joint with complete extension, flexion to 90°, and no abnormal mobility either anteroposterior or lateral.

In most cases of severe internal derangement of the knee-joint the disability, Milch believes, is due primarily to loss of integrity of the internal lateral ligament, and he recommends that treatment should be directed towards repair of this structure. In the worst cases this involves an open operation, with reconstruction of the ligament from the fibres of the fascia lata; but where the internal lateral ligament is intact he advises conservative treatment. One such case is cited in which even immobilisation was dispensed with. The diagnosis was rupture of the posterior part of the capsule, together with a tear of the anterior cruciate and fibular collateral ligaments, the last being shown by a possibility of hyperadduction to 15°. A knee cage brace was fitted, the sole and heel were raised on the outer border of the shoe, and the patient was allowed to walk about for six months. The result was good, and he now engages normally in sports.

Ski-ing accidents provide a number of these severe injuries to the knee-joint every winter, and it will be interesting to learn how far Milch's views on the relative unimportance of cruciate ligament injuries are upheld by other surgeons.

THE ESTIMATION OF IODINE

THE increasing attention which is being paid to the significance of small quantities of physiologically active materials is well exemplified by the case of iodine. The widespread occurrence of this element has long been known, but there has been a dearth of trustworthy data concerning its quantitative distribution owing to the lack of uniform methods of analysis. To remedy this state of affairs the Medical Research Council appointed a "Committee on Methods for the Estimation of Iodine," the expenses of which were defrayed by the Nitrate Corporation of Chile, Limited, and asked Mr. C. O. Harvey, a member of the Government Chemist's staff, to make the actual investigation. In his report[1] Mr. Harvey describes an improved and standardised method which he has devised, capable of giving consistent results when parts of the same specimen are tested by independent analysts. He sets out precise details for carrying out the analyses, with the various modifications required for the different materials analysed. Emphasis is laid on unsuspected pitfalls such as the necessity for employing pure nickel dishes in place of those containing copper alloyed with the nickel or even platinum dishes; strict precautions are necessary for avoiding contamination from impure chemicals or from laboratory air, and the titrations must be carried out on a bench not used for the other operations described. Promotion of further work on iodine in relation to the nutrition and health of man and animals, in which Mr. Harvey's method is likely to prove useful, has been entrusted to a new committee, appointed jointly by the Medical Research Council and the Agricultural Research Council. A reliable method of estimating the iodine content of the blood may well afford material for a more effective attack on hyperthyroidism.

THE death is announced on August 8th of Mr. Hugh Walker, ophthalmic surgeon to the Victoria Infirmary, Glasgow.

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[1] Arch. of Surg., 1935, xxx., 805.

[1] M.R.C., Spec. Rep. Series No. 201. H.M. Stationery Office. Pp. 43. 1s.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXV.—PROGNOSIS IN CONGENITAL STENOSIS OF THE PYLORUS

IN congenital stenosis of the pylorus we can recognise definite pathological changes, although the underlying cause is not yet clearly understood. The main feature, as is well known, is a marked hypertrophy or local gigantism of the circular muscle-fibres of the pyloric canal, which manifests itself by obstructive symptoms, usually at the age of about three weeks, and results in gradually increasing dilatation and hypertrophy of the walls of the stomach.

Of the two methods of treating congenital pyloric stenosis, recent experience has shown that medical treatment is uncertain in its results, requires a considerable period of time and, if unsuccessful, may lead to a grave state of malnutrition. It is now almost universally agreed that operation is the most satisfactory method of treatment, and we would emphasise, therefore, that in this article we are discussing the prognosis in cases treated surgically.

DIFFERENCE BETWEEN PRIVATE AND HOSPITAL CASES

The parents of an infant with pyloric stenosis demand first, an opinion on the chances of that particular infant surviving the operation; secondly, they are concerned with the ultimate prognosis, or, in other words, with the end-results of treatment, provided the infant survives the immediate risk. The factors governing operative prognosis in this condition are complex and probably not entirely understood, but it is the general experience that the outlook is much more hopeful in the private than in the hospital case. If we can find the reasons for this difference between hospital and private cases, we may be enabled to discover important factors which have a bearing on the immediate prognosis. How does the hospital case differ from the private case? At birth there is probably no difference at all, both infants apparently being strong and healthy, and not infrequently above the average birth weight. It is after the characteristic symptoms have commenced that the difference manifests itself. The mother of the infant which is ultimately brought to hospital is frequently harassed and preoccupied, and the fact that her baby is vomiting occasionally may not at first give rise to any serious concern. Eventually, perhaps on the prompting of a neighbour, she will decide that her breast milk is not agreeing with the child, and various feeds are tried in quick succession in a vain attempt to find something "which suits baby's stomach." The medical profession is not altogether blameless in this respect, since it is not always the interfering but well-meaning neighbour who advises the mother to wean her infant. Finally, after several weeks have elapsed, during which time the infant has been going rapidly downhill, he is brought to hospital in a state of extreme inanition, and operation is fraught with serious risks. It is this long delay which is so disastrous in a high percentage of hospital cases, since it means not only that at operation the child's resistance is at its lowest ebb, after weeks of starvation, but also that thereafter he is irrevocably deprived of his mother's milk which has long since dried up. It is little wonder that the mortality-rate in such cases is high.

The well-to-do mother has more leisure and can usually observe her infant more closely and, perhaps, though not always, more intelligently. Further, she is apt to be far more exacting in her demands on her medical attendant; he is likely to be summoned at the first sign of trouble, and she does not hesitate to demand a second opinion regarding her infant if she is not completely satisfied. This attitude reacts favourably on the infant, since it means that the pyloric obstruction will probably have been diagnosed and treated at an earlier stage than has that of the hospital infant, the child will not be so starved and dehydrated when it comes to operation, and, furthermore, the mother's milk will still be available at the critical post-operative period—a point of extreme importance. We believe that the mother is the best custodian of her infant in sickness or in health, and the very fact of removing an infant from its mother and placing it in the strange, somewhat impersonal atmosphere of a hospital, may do much more harm than is generally realised.

Here, then, are factors which may serve to guide us in giving an opinion regarding the immediate prognosis in any particular case. We must ascertain the duration and severity of symptoms, we must note the infant's general condition, and we must determine whether breast-feeding is going to be possible after operation. If these crucial questions have to be answered unfavourably, prognosis must be very guarded, since the mortality-rate may be 20 per cent. or even higher. If, on the other hand, the answers are favourable, we are justified in giving a favourable prognosis since, in our experience, the mortality-rate in this type of case is extremely low. In the experience of one of us (G. H.) over a number of years, the mortality-rate in hospital cases of pyloric stenosis is rather more than 20 per cent., whereas no private case has been lost, and we suggest that this remarkable difference may be explained to a large extent by the factors outlined above.

TECHNIQUE OF TREATMENT

The question of operative technique must, of course, have a bearing on the immediate prognosis, and although the Rammstedt operation, now generally adopted, is a comparatively simple procedure, it should, wherever possible, be performed by a surgeon who is experienced in children's surgery. Gentleness, combined with speed, is essential if post-operative shock is to be reduced to a minimum. A good deal of stress has been laid on the value of blood transfusion before and after operation to minimise shock and to increase the child's resistance, and in our experience this measure has been of distinct value in severe cases. Preliminary gastric lavage is desirable, and the parenteral administration of glucose-saline solution before and after operation is important owing to the dehydration which is invariably present to some degree. The great value of breast-feeding during the post-operative period has already been stressed, but if this is not possible, *frequent small* feeds should be given of some readily assimilable food such as peptonised milk. Nothing should be given by the mouth for four hours after operation. It is our practice then to give 2 drachms of glucose and water hourly for four to six hours, and thereafter an ounce of peptonised milk may be prescribed at two-hourly intervals; the amount of the feed and the length of the interval are gradually increased until by the third day after operation the infant is receiving a feeding appropriate to its age and weight. Close attention to details of feeding and general management during the few days subsequent to operation is of extreme importance. The method of anæsthesia adopted does not appear to affect the issue, since in our series of cases both general and local anæsthesia have been tried and the mortality-rate has remained fairly constant. We do, however, favour local anæsthesia, supplemented, when necessary, by gas-and-oxygen.

POST-OPERATIVE COMPLICATIONS

Of the post-operative complications, the most frequent and most dreaded is *enteritis*. Here, again, it may be said that enteritis scarcely ever occurs in the private case, and its occurrence is probably governed by the same factors as influence operation mortality. Other complications such as *hyperpyrexia* and *hæmorrhage* are fortunately very rare, and their effect on prognosis is therefore *negligible*.

ULTIMATE PROGNOSIS

With regard to the ultimate prognosis in those infants who survive the operation and the post-operative convalescence, the problem is fortunately a simple one. We can confidently assure the parents that their child will grow up as any other child, and that no disability will mar its later life as a result of the congenital defect treated in infancy.

SUMMARY

At the present time the lives of many infants of the hospital class suffering from congenital pyloric stenosis are needlessly lost owing to long delay in diagnosis and unnecessary weaning, and until the possibility of this condition is considered in every infant with persistent vomiting, constipation, progressive loss of weight, and visible gastric peristalsis, prognosis must remain very guarded. The satisfactory results obtained with these cases in private practice, where circumstances permit of earlier diagnosis, serve to emphasise the fact that the mortality-rate for all cases is capable of being reduced to a very low figure, and we must hope that in the not too distant future it will be possible to predict with confidence a favourable outcome in the vast majority of infants with pyloric stenosis, irrespective of the class of society to which they belong.

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SPECIAL ARTICLES

THE EFFECT OF INFLUENZA EPIDEMICS ON THE CERTIFIED CAUSES OF DEATH

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THE idea that epidemic influenza usually occurs a "*setting*" of associated strange fevers, agues, r dyspepsias finds a place in the writings of several pidemiologists and the association between influenza prevalence and that of certain other diseases with somewhat ill-defined respiratory, nervous, or gastro-intestinal symptoms has been stressed especially by Sir William Hamer.[1]

The 1918–19 epidemic in England and Wales was carefully studied in a Supplementary Report of the Registrar-General[2] with a view to leaving a permanent record of the manner in which deaths said to have resulted from influenza alone or in combination with other causes were certified, and a general broad estimate was also made of the contemporaneous deaths attributed to phthisis, pneumonia, bronchitis, and heart disease which probably resulted from the epidemic waves. This latter effect upon the certification of deaths from other causes individually could not be assessed from the experience of a single year, but experience has now accumulated of more recent epidemics—notably in 1922, 1927, 1929, and 1933, and it seemed worth while to try to determine with more definiteness what happens to the mortality as described on death certificates during the months when influenza is highly prevalent.

If influenza waves tend to be accompanied by an increased activity of other infections having some kind of affinity for influenza, or by a condition of the population rendering it more liable to succumb to other diseases, this should be evidenced by an increase over expectation in the mortality attributed to these other causes during influenza epidemics. The same thing would happen, however, with regard to chronic pathological conditions if superimposed influenzal infection frequently led to death which would otherwise have been postponed, provided that in many such cases the superimposed influenza was not recognised as such or not thought worthy of mention on the death certificate. If, on the other hand, there is any truth in the statement, sometimes made by persons who are themselves immune to influenza, that "an influenza epidemic can be created by talking about it," the implication being that once the medical profession has decided that an epidemic has begun many ill-defined causes of illness and death will be attributed to influenza, thus exaggerating the wave of prevalence or mortality assigned to it, we should expect to find that during epidemics the deaths attributed to such other causes would show a compensatory decline rather than an increase.

Collins,[3] in an instructive study of weekly influenza and associated mortality during 1918–29 in a group of 35 cities of the U.S.A., found that in the pandemic of 1918–19 about 8 per cent. of the excess mortality from all causes was credited to causes other than influenza or pneumonia, in the 1920 epidemic 23 per cent., and in the minor epidemics since 1920 about 40 per cent. About half of this excess mortality was attributed to other causes, with influenza or pneumonia stated as contributory, the remaining half having no mention of influenza or pneumonia, but being attributed to conditions such as heart disease, nephritis, cerebral hæmorrhage, phthisis, or bronchitis. As will be seen below, analysis of mortality in England and Wales during 1921–32 by months leads to a similar general conclusion, though the different precedence given in the two countries to influenza and pneumonia when stated in combination with other causes precludes exact comparison. The present analysis, however, has been carried out for each of some 45 causes separately in the endeavour to ascertain which particular causes show the most pronounced sympathetic increase in mortality during influenza epidemics and which are unaffected, and to seek a reason for this.

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[1] Hamer, Sir W. H.: Proc. Roy. Soc. Med., 1931, xxiv., 1425; 1933, xxvii., 5.

[2] Supplement to 81st Annual Report of Registrar-General, 1920.

[3] Collins, S. D.: Public Health Reports, Washington, 1932, xlvii., 2159.

Winter Influenza since 1920

Since the pandemic of 1918–19 influenza epidemics in England and Wales have shown a decided preference for the first quarter of the year, as may be readily seen from the diagrams for London produced by Mr. Spear in his recent paper.[4] In the 52 quarters from mid-1920 to mid-1933 the deaths assigned to influenza in England and Wales ranged from 2306 to 23,927 in the first quarters, but never exceeded 4015 in the second, 705 in the third, and 2362 in the fourth. Only in 1923 and 1926 were the first quarter's deaths exceeded by those in any other quarter (the second in each instance). Dealing with the separate months of the first quarter, the distribution of the 39 months of January, February, March, in the 13 years 1921–33 according to the number of influenza deaths which occurred is shown in Fig. 1 and Table I. To facilitate subsequent reference an arbitrary division has been made into "normal" months, defined as months having up to 2000 influenza deaths, "mild" epidemic months with 2001–4000, "moderate" epidemic months with 4001–7000, and "severe" epidemic months with over 7000 deaths.

TABLE I

Distribution of Months of First Quarters of 1921–33 *according to Number of Influenza Deaths* (*England and Wales*)

—	Deaths.	January.	February.	March.
"Normal"	Up to 1000	1921, 1923, 1926, 1930,	1923, 1926, 1928, 1930,	1923, 1930.
	1001–2000	1924, 1925, 1928, 1931.	1921	1921, 1922, 1926, 1928, 1933.
Mild epidemic.	2001–3000	1929	—	1932
	3001–4000	1927, 1932	1925, 1931, 1932	1925
Moderate epidemic.	4001–5000	—	1924	1927, 1931
	6001–7000	—	1922	1924
Severe epidemic.	7,001–8,000	—	1933	—
	9,001–10,000	1922	1927, 1929	—
	11,001–12,000	1933	—	1929

There were two Januaries in the moderate or severe categories, but February attained that level in five years and March in four. In 1933 January had 11,502 deaths attributed to influenza (the only month giving a higher total being March, 1929), whilst February recorded 7135 deaths.

When the 13 Januaries from 1921 to 1933 are arranged in order of influenza death-rate, it is found that the daily mean air temperature in England and Wales in the five months with highest influenza-rate was 39·4° F., whereas for the five months with lowest influenza-rate it was 42·5° F. For February the mean temperatures were, for the 5 highest influenza months 38·5° and for the 5 lowest 41·7°, whilst for March the corresponding figures were 41·9° and 43·6°. In view of this association between coldness and influenza mortality in the winter months, which might lead to erroneous conclusions, especially when respiratory diseases are under consideration, the analysis from which Fig. 2 has been drawn was carried out by separating the 36 months of the first quarters of 1921 to 1932 into two groups of (1) 18 warmest months for which the curves are continuous lines, and (2) 18 coldest months shown as broken lines. In Table II., however, each month, January, February, or March, has been treated separately and no division into cold and warm months has been made. These two analyses relate to the 12 years ending with 1932, the figures for 1933 not being available when the work was commenced.

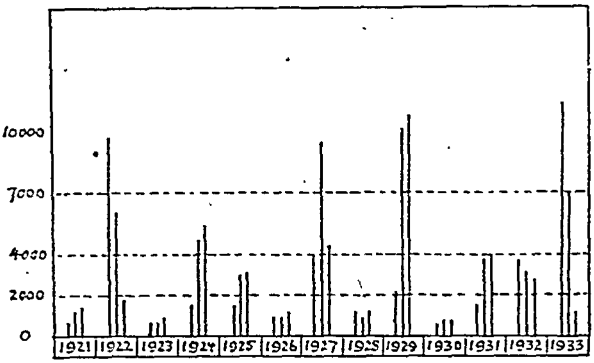

FIG. 1.—Influenza deaths in January, February, and March of each year 1921–33, in England and Wales.

METHOD OF ANALYSIS

The method of calculation was as follows. The number of deaths expected in each month was first calculated by assuming that the upward or downward trend of annual deaths from a given cause, owing to population increase, changes in prevalence, fatality, diagnostic accuracy or fashions in certification, proceeded in arithmetical progression during the period, and was represented by a straight line drawn through points having as ordinates the mean annual deaths in the quinquennium 1921–25 centred at 1923 and the mean annual deaths in 1926–30 centred at 1928. The total January deaths from the given cause in the decade 1921–30 were then assumed to be subject to the same fractional annual increment or decrement as the total deaths for the years as a whole—that is to say, the slope of the expected trend was assumed to be the same for each individual month as for the whole year. For a few causes, such as infantile diarrhœa, this would not be a safe assumption, but for the causes in Table II. there seems no reason why the general expected trend should be different for one month than for another. Thus the expected January deaths were represented by a straight line passing through a point whose ordinate, erected between 1925 and 1926 on the time scale, was equal to the mean January deaths in the decade 1921–30, the slope of the line being as determined above for the years as a whole. The annual decrements or increments thus calculated from the decade were assumed to continue constant until 1932, the straight line being prolonged to that year. Fluctuations above or below this expected datum line were assumed to be due to factors not progressively changing during the period but fluctuating from month to month and year to year, such as meteorological conditions and influenza epidemics.

At the head of Table II. the 12 years have been arranged in order of increasing influenza death-rate for the month in question and then divided into groups of three. Thus the order for the Januaries is 1930, 1923, 1921, 1926, 1928 and so on. The mean influenza-rate per million in each successive group of three months is then shown; for the Januaries it rises from 210 for the first group to 1735 per million for the last group. The actual deaths attributed to each cause in the Table were expressed as a percentage of the expected deaths in that month, and the figures shown in a given column are the means of the resultant percentage ratios for the three months named at the head of that column. That is to say, they are indices

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[4] Spear, B. E.: THE LANCET, 1934, ii., 1331.

TABLE II

WINTER MORTALITY FROM VARIOUS CAUSES (PER CENT. OF THAT EXPECTED FROM THE SECULAR TREND), THE YEARS 1921 TO 1932 BEING ARRANGED IN ORDER OF INCREASING INFLUENZA DEATH-RATE FOR THE MONTH IN QUESTION

—	JANUARY.				FEBRUARY.				MARCH.			
Years forming group	1930 1923 1921	1926 1928 1931	1925 1924 1929	1932 1927 1922	1923 1930 1926	1928 1921 1925	1932 1931 1924	1922 1927 1929	1930 1923 1928	1926 1921 1922	1932 1925 1931	1927 1924 1929
Mean air temperature	43·3	40·5	39·5	41·3	41·5	41·8	38·8	38·0	42·9	43·3	40·5	42·9
Mean influenza death-rate	210	371	540	1735	247	555	1268	2819	296	466	955	2273
	Mean percentage ratio of actual to expected deaths.											
ALL CAUSES	86	99	99	116	83	88	107	131	89	93	102	122
All causes except influenza and respiratory diseases	95	97	99	110	93	100	109	110	95	104	99	105
*Whooping-cough	54	73	119	136	63	67	83	180	61	78	98	166
*Measles	89	159	94	79	134	94	120	81	180	67	112	93
*Diphtheria	113	91	84	98	97	103	84	109	97	120	78	84
*Acute poliomyelitis	83		102		90		100		106		83	
*Encephalitis lethargica	111		82		112		76		90		104	
*Cerebro-spinal fever	130		122		105		154		100		155	
*Cancer	98	101	102	99	98	100	102	101	101	99	99	100
*Respiratory tuberculosis	92	102	102	107	92	94	104	112	96	96	104	108
*Tuberculous meningitis	101	92	100	90	98	104	110	99	100	99	99	104
*Rheumatic fever	101	102	93	95	102	103	92	99	105	102	87	93
Erysipelas	102	110	89	94	100	107	84	101	95	98	116	101
Septicæmia, &c.	115	97	84	90	99	106	83	107	102	103	79	96
Rheumatoid and osteoarthritis	88	101	101	103	83	96	118	120	93	96	93	108
Diabetes	95	103	99	111	94	93	100	115	101	96	105	105
†Diseases of nervous system	95	101	96	102	94	97	100	110	96	96	97	106
Epilepsy	95	111	102	103	95	95	109	109	95	98	103	105
Diseases of ear and mastoid	105	106	96	96	103	96	101	100	99	107	94	101
Heart diseases	90	98	104	110	84	89	108	133	95	92	108	112
Aortic disease	89	107	104	102	96	94	101	107	98	97	105	104
Mitral disease	91	103	103	102	83	95	102	117	101	93	95	108
Fatty heart	87	99	107	100	90	90	106	116	96	92	97	112
Other myocardial disease	98	100	103	113	79	95	108	127	90	102	108	113
‡Cerebral hæmorrhage, &c.	92	103	112	104	[illegible]	[illegible]	104	111	96	94	108	108
Arterio-sclerosis	86	102	100	100	[illegible]	[illegible]	91	114	96	91	91	112
Respiratory diseases	72	103	107	126	[illegible]	[illegible]	111	149	80	81	103	145
Acute bronchitis	65	104	110	144	66	[illegible]	126	193	72	77	124	159
Chronic bronchitis	68	103	110	122	73	[illegible]	108	152	81	82	104	140
Broncho-pneumonia	69	102	104	131	64	[illegible]	113	158	73	80	95	156
Lobar pneumonia	84	101	106	107	83	[illegible]	101	125	95	83	97	120
Pneumonia not defined	80	99	106	122	75	[illegible]	104	152	80	80	91	124
Asthma	66	103	106	126	66	[illegible]	100	144	78	75	102	115
Gastritis	102	103	95	97	93	[illegible]	[illegible]	99	99	104	103	99
Gastric and duodenal ulcer	97	106	98	98	95	[illegible]	[illegible]	103	105	93	102	98
Appendicitis	98	108	105	98	94	[illegible]	105	105	105	95	96	101
Acute nephritis	93	104	105	103	104	[illegible]	[illegible]	103	97	97	96	104
Chronic nephritis	94	96	105	99	93	[illegible]	[illegible]	107	102	101	92	100
Cystitis, &c.	95	109	94	113	94	96	[illegible]	114	94	89	114	110
*Puerperal sepsis	101	117	99	89	100	105	[illegible]	99	105	106	105	93
Puerperal hæmorrhage	117	89	85	93	107	99	[illegible]	92	113	85	75	116
Puerperal albuminuria	104	76	94	100	90	106	[illegible]	99	101	113	81	89
Premature birth	99	102	98	112	92	99	112	108	96	100	109	107
"Old age"	84	100	104	114	85	88	105	127	88	92	108	120
*Suicide	104	98	96	106	105	100	100	98	101	109	89	100

* Usually taking precedence over influenza when associated with it as cause of death. † Excluding cerebral hæmorrhage. ‡ Including cerebral hæmorrhage secondary to arterio-sclerosis.

representing the mortality experienced (corrected for the general annual trend of population and other factors affecting certification of the particular disease during the period covered) in groups of months when these have been arranged in ascending series of their influenza death-rates. In similar fashion the graphs in Fig. 2 have been drawn by arranging the 18 warmest months, out of the 36 first quarters' months in the 12 years, in order of increasing influenza death-rate, dividing into convenient groups of three or more and plotting the mean of the percentage ratios of actual to expected deaths in each group of months against the mean monthly influenza death-rate for the group. The influenza-rate represents the number of deaths per 1000 living which would occur in a year if they continued at the same rate as during the month in question. The process was then repeated for the 18 coldest months, giving the second graph.

Influenza Certified as Joint Cause of Death

Before considering [illegible] results and what they signify it is necessary [illegible] understand what diseases take precedence over [illegible] when stated on death certificates jointly [illegible] the cause of death. Of the causes [illegible] Table II. (*a*), whooping-cough, measles, diphtheria, acute poliomyelitis, encephalitis lethargica, cerebro-spinal fever, puerperal sepsis, and suicide were generally given precedence over influenza when mentioned in conjunction with it, and also in the majority of cases tuberculosis, cancer, and rheumatic fever. On the other hand, deaths from (*b*) the other causes in Table II., if mentioned jointly with influenza, would in almost all cases be assigned to the influenza group. It follows from this that when influenza is epidemic additional deaths due to influenza being superimposed on or complicated by any of the conditions (*a*), starred in Table II., would be assigned to the condition in question and would tend to enhance the deaths classed to it; and this would occur whether the associated influenza was mentioned on the certificate or not. Analysis of the deaths assigned to these causes during 1933 epidemic, in which influenza was mentioned as a complication, was carried out in order to throw more light upon the results for this group (see below). Additional deaths brought about or hastened by influenza complicating any disorders of the second group (*b*), not starred in Table II., would be either (1) assigned to influenza if that was mentioned as an associated cause, or (2) assigned to the other cause if influenza had not been recognised or mentioned as a complicating condition. In the event of alternative (1) the actual deaths classed to the cause in question would thereby tend to be *diminished* during influenza epidemics, but in the event of alternative (2) they would tend to be *increased* during epidemics. If a net increase is observed for one of these (*b*) causes it must be concluded that the number of additional deaths from that cause associated with the epidemic, but for which influenza was not recognised as a complication or not mentioned on the certificate as such, exceeded the number in which it was so recognised and mentioned.

Whooping-cough Mortality during Influenza Epidemics

Whooping-cough and measles present remarkable contrasts both in Table II. and Fig. 2, for whilst whooping-cough mortality was more enhanced by coincident influenza than any other of the causes examined, measles ortality was not enhanced, t on the contrary tended be slightly less during uenza epidemics. The ect of influenza on whoopg-cough deaths was evident alike in January, February or March; thus in the groups of months of lowest influenza-rate the actual deaths were only 54 per cent. of those expected for January, 63 per cent. for February, and 61 per cent. for March, whereas in the groups of months of highest influenza-rate the corresponding percentage ratios were 136, 180, 166. This means that deaths attributed to whooping-cough were two and a half to three times as many during severe influenza epidemics as during the same months of the years when influenza was at a low level. Fig. 2 shows that this took place whether the months were warm or cold, and with a given influenza-rate it was not enhanced by cold but rather the reverse, as shown by the relative positions of the two graphs.

When the 36 months are grouped according to the number of influenza deaths occurring, the mean deaths per month attributed to whooping-cough are shown in Table III. to increase continuously from 350 in months having less than 1000 influenza deaths to 1536 in the month having 11,838 influenza deaths. In order to ascertain the rate of increase of deaths assigned to whooping-cough and some other causes, in Table IV. the columns of Table III. have been condensed into three groups, the first (A) consisting of the 19 months (shown in Table I.) with a "normal" influenza level of under 2001 deaths, the second (B) consisting of the 13 mild or moderate epidemic months with 2001–7000 deaths, and the third (C) of the 4 severe epidemic months with over 7000 deaths.

From Table IV. it appears that for every 100 deaths attributed to influenza in excess of the "normal," during mild or moderate epidemics 7 additional deaths, or during severe epidemics 9 additional deaths, were attributed to whooping-cough. These are average figures, the number of additional deaths in a given year being naturally dependent not only upon the severity of the influenza epidemic but also upon the number of whooping-cough cases present at the time. Thus at the end of 1932

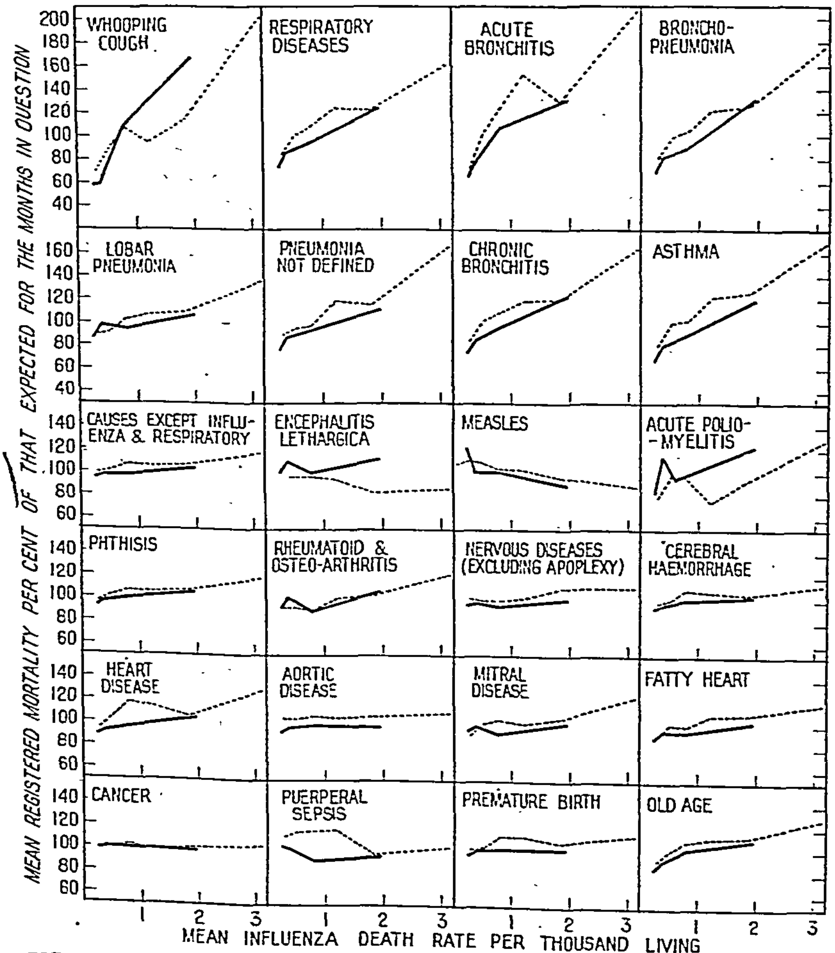

FIG. 2.—Effect of increasing influenza prevalence on the mortality attributed to various causes during the months of January, February, and March, 1921–32.

———— 18 warmest months (mean air temperature exceeding 41° F.)
.... 18 coldest months (mean air temperature 41° F. or below).
} Arranged in order of increasing influenza death-rate.

TABLE III

MEAN DEATHS PER MONTH WHEN THE 36 MONTHS OF THE FIRST QUARTERS OF 1921–32 ARE ARRANGED ACCORDING TO NUMBER OF INFLUENZA DEATHS

Influenza deaths	0–1000	1001–2000	2001–3000	3001–4000	4001–5000	6001–7000	9001–10,000	11,001–12,000
Months	10	9	2	6	3	2	3	1
Mean deaths per month.								
Influenza—								
with respiratory complications	490	937	1,688	2,401	3,170	4,408	7,362	9,236
without respiratory complications ..	307	483	677	1,011	1,259	1,794	2,354	2,602
Whooping-cough	350	450	491	505	577	943	1,122	1,536
Respiratory diseases (without mention of influenza)	7,445	9,150	9,670	9,560	10,795	13,798	16,778	17,405
Tuberculosis (pulmonary)	2,789	3,055	2,989	2,481	3,178	3,382	3,439	3,576
Diseases of circulatory system	8,317	8,678	13,615	10,756	10,285	8,275	11,548	15,012

whooping-cough was presumably at a low level when the influenza epidemic began, since only 421 deaths occurred in the fourth quarter compared with an average of 628 in the preceding 12 fourth quarters. The resulting excess in January and February, 1933, due to the superimposed influenza might therefore be expected to fall short of the 9 per 100 influenza deaths averaged during the severe epidemics of 1922, 1927, 1929. Actually, as shown in Table V., the excess of whooping-cough deaths resulting in the months of January and February, 1933, above the average for the same months of 1928 and 1930 (with influenza normal) was only 327, or 2 per cent., instead of 9 per cent. of the influenza deaths. For all causes combined other than influenza and respiratory disease, the observed excess was, however, almost exactly equal to the number expected by applying the percentage rates in the last column of Table IV.

Examination of the 801 whooping-cough death certificates for January–February, 1933, revealed only 22 with any mention of influenza as a complication, so it is evident that the excessive mortality attributed to whooping-cough during influenza epidemics is not for the most part recognised as being due to a double infection. (In the fourth quarter of 1918, with its 98,280 influenza deaths, 906 whooping-ugh deaths were stated to be complicated by [illegible] in 119 instances.) It cannot therefore be oved that the influenza wave is the *cause* of the excessive mortality from whooping-cough, since they may both arise from some common factor unknown, but Fig. 2 shows that this factor could not be the rather greater coldness of the months when influenza happened to be epidemic. The explanation which most readily suggests itself is that the double infection is characterised by a very high fatality and is not usually recognised as anything other than whooping-cough with respiratory complications. The fact that in the 1933 epidemic both whooping-cough and respiratory disease mortality fell much below the expected figures, whilst other mortality reached the expected level, based on the previous severe epidemics of 1922, 1927, and 1929, suggests that it may be the *secondary* infections of influenza which spread to whooping-cough cases and prove specially fatal to them.

The absence of any similar consistent increase of deaths from measles or diphtheria during influenza epidemics suggests that the phenomenal increase of *whooping-cough mortality is of real significance* and of some epidemiological importance, and is not merely the outcome of unsatisfactory medical certification, which is *liable to be blamed* without adequate reason for anything which cannot be explained.

The occurrence of a wave of whooping-cough fatality contemporaneous with that of influenza is demonstrated in another way in Table VI., where the twelve years 1921–32 have been divided into the six years of highest influenza during the first quarter, indicated by +, and the six years of lowest influenza, indicated by —. The mean numbers of deaths during the first quarter, the two quarters coming before it, and the three quarters following, and the excess of the first quarter's deaths over the mean of those in the quarter immediately preceding and succeeding it are shown for each group.

In the "normal" years the average seasonal swing of influenza deaths was from about 600 in

TABLE IV

MEAN EXCESS OF DEATHS PER MONTH DURING INFLUENZA EPIDEMICS

	A.	B.	C.			Excess over normal, per 100 influenza.	
	Normal months.	Mild or moderate epidemic.	Severe epidemic.	Excess of B. over A.	Excess of C. over A.	During ordinary epidemics.	During severe epidemics.
Months	19	13	4				
Mean deaths per month.							
Influenza, total	1,092	3,915	10,240	2,823	9,148	100	100
Influenza with respiratory complications .. .. Number	702	2,777	7,831	2,075	7,129	73	78
Influenza with respiratory complications .. .. *Per cent.*	64	71	76	73	78	73	78
Whooping-cough	397	587	1,226	190	829	7	9
Respiratory diseases (influenza not stated) ..	8,253	10,514	16,935	2,261	8,682	80	95
Tuberculosis (pulmonary)	2,915	3,043	3,473	128	558	5	6
Mitral disease	902	959	1,201	57	299	2	3
Cerebral hæmorrhage	3,035	3,407	3,660	372	625	13	7
"Old age"	2,322	2,503	3,141	181	819	6	9
Other diseases of heart and circulation ..	6,933	8,924	10,383	1,991	3,450	71	37
Other diseases	18,513	18,690	19,475	177	962	6	11
Total (not influenza)	—	—	—	—	—	190	177

the summer quarter to 3600 in the winter quarter, and of whooping-cough from about 700 to 1250. In the epidemic years, with a mean influenza peak going up to 15,000 in the winter quarter, the whooping-cough swing was increased to 653, 676, 2100, 1130, 559 for the five quarters from summer to summer. Measuring by this method the excess of the March quarter's deaths over the average of the December and June quarters, it is seen in the final column that an excess of 11,435 influenza deaths was accompanied by an excess of 850 whooping-cough deaths, or about 8 per 100, as found by the previous analysis (Table IV.)

Mortality from other Epidemic Diseases in Influenza Months

Table II. shows that the association of influenza epidemics with the mortality attributed to *diphtheria* was, if anything, negative during 1921–32. Thus taking the means of pairs of columns, January gives 102 for low influenza months and 91 for epidemic months, February gives 100 and 97 respectively, and March 108 and 81. Since diphtheria was given precedence over influenza when the causes were mentioned jointly, this cannot be due to peculiarities of certification. Out of 452 diphtheria deaths occurring during the 1933 epidemic of January and February, influenza was mentioned on four certificates only as a complicating condition, compared with 40 out of 1334 in the fourth quarter of 1918.

Measles manifested a similar negative association with influenza; thus taking the mean ratios in Table II. for the six low and six high influenza months, January gives 124 and 87, February 114 and 100, March 123 and 102. The inverse relation is shown also in Fig. 2, and is difficult to account for, since measles takes precedence over influenza. Only on three certificates was influenza mentioned in conjunction with measles in 1933. It may be that when influenza is very prevalent the physician called in to treat a child with broncho-pneumonia who is stated to have had measles, often prefers in the event of death to attribute the broncho-pneumonia to influenza than to the measles he did not see, but on this point I should like to have the opinions of practitioners.

Acute poliomyelitis deaths were somewhat more numerous when influenza was epidemic in January or February, but not in March, and Fig. 2 shows no evidence of increase save in the months of very severe influenza. There is no conclusive evidence of association owing to the small numbers of deaths and of months involved. Out of 202 deaths from acute poliomyelitis during 1933 influenza was mentioned on only one certificate.

Encephalitis lethargica deaths show no consistent relation with influenza, an apparent negative effect for January and February being offset by a positive one for March. Fig. 2 shows no effect whatsoever when the months are separated into cold and warm groups, but there is evident a curious excess of deaths in the warm over the cold months when months of equal influenza are compared, which accounts for the apparent negative relation with influenza when Januaries or Februaries of all degrees of coldness

TABLE V

Excess of Deaths during the Influenza Epidemic of January and February, 1933, over the Average Experience of 1928 and 1930 with Normal Influenza Incidence

—	Excess expected from number of influenza deaths.*	Actual excess over mean of 1928, 1930.	With mention of influenza on med. certificate.
Influenza	—	16,993	16,993
Respiratory disease (without mention of influenza) ..	16,058	7,410	—
Whooping-cough	1,521	327	82
Tuberculosis (pulmonary) ..	1,014	858	277
Mitral disease	567	263	—
Cerebral hæmorrhage	1,183	1,333	—
"Old age"	1,521	753	—
Other diseases	8,118	10,134	189†
Total (other than influenza and respiratory diseases) ..	13,859	13,663	455†

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* By multiplying 16,993 by percentages in last column of Table IV. (based on 1922, 1927, 1929, experience).

† For diseases taking precedence over influenza only, including 99 cancer, 18 encephalitis lethargica, 17 syphilitic diseases, 6 deaths from violence, &c. (see text).

TABLE VI

MEAN NUMBER OF DEATHS IN THE FIRST QUARTER COMPARED WITH THOSE IN PRECEDING AND FOLLOWING QUARTERS, FOR (+) 6 INFLUENZA EPIDEMIC YEARS AND (—) 6 YEARS OF LOW INFLUENZA (1921–32). ALSO FOR 1933

—			Third quarter preceding year.	Fourth quarter preceding year.	First quarter.	Second quarter.	Third quarter.	Fourth quarter.	Mean of quarters just before and after first.	Excess of first quarter over this.
1921–32.	Influenza.	+	573	1,977	15,163	2,429	533	1,771	2,203	12,960
		—	596	1,603	3,607	2,562	565	1,906	2,082	1,525
		Difference	—23	+374	+11,556	—133	—32	—135	+121	+11,435
	Whooping-cough.	+	653	676	2,100	1,130	559	514	903	1,197
		—	683	580	1,253	1,231	773	735	906	347
		Difference	—30	+96	+847	—101	—214	—221	—3	+850
	Tuberculosis (pulmonary).	+	6,567	7,522	9,442	7,951	6,447	7,237	7,736	1,706
		—	6,811	7,785	8,700	8,082	7,026	7,748	7,933	767
		Difference	—244	—263	+742	—131	—579	—511	—197	+939
	Respiratory diseases.	+	..	16,832	35,947	15,406	..	..	16,119	19,828
		—	..	18,197	24,223	15,873	..	..	17,035	7,187
		Difference	..	—1,365	+11,724	—467	..	..	—917	+12,641
	Mitral disease.	+	1,970	2,465	3,092	2,334	2,065	2,517	2,395	697
		—	2,000	2,518	2,619	2,226	1,918	2,457	2,372	243
		Difference	—30	—53	+472	—108	+147	—60	+23	+444
1933	Influenza		471	2,010	19,849	1,054	331	..	1,532	18,317
	Whooping-cough ..		574	421	1,071	465	357	..	443	625
	Tuberculosis (pulmonary)		5,793	6,448	8,619	6,745	5,583	..	6,597	2,022
	Respiratory diseases ..		..	12,752	26,458	9,754	..	..	11,253	15,205
	Mitral disease		2,676	2,576	3,147	2,188	1,870	..	2,382	765

are combined as in Table II. This disease and acute poliomyelitis are the only causes in Fig. 2 to show higher rates for the warm than the cold months. During the January-February influenza epidemic of 1933 influenza was mentioned as a complicating cause on 18 certificates out of a total of 179 deaths assigned to encephalitis lethargica, and in the remaining ten months of the year it was mentioned on six certificates out of 636.

Cerebro-spinal fever deaths were more numerous in the months of February and March when influenza was most prevalent, but this was not true for January. No conclusions can be drawn owing to the fact that a strong epidemic wave of the disease occurred during 1931 and 1932 after a period of comparative quiescence.

TUBERCULOSIS

Mortality from tuberculosis of the respiratory system increased steadily and consistently with rising influenza-rate, from 92 to 107 per cent. of expectation in January, 92 to 112 in February, and 96 to 108 in March (Table II.). The graphs in Fig. 2 bring out the slight but definite effect of coldness, but show the effect of influenza to be of greater importance than that of temperature.

Table III. gives the mean numbers of phthisis deaths in groups of months with increasing influenza, and Table IV. shows that during severe epidemics more than 500 deaths per month were registered from this cause in excess of expectation founded on normal periods. To every 100 additional influenza deaths during epidemics five or six additional phthisis deaths occurred. Table V. indicates that in January-February, 1933, with excess of 16,903 influenza deaths, the expected sympathetic excess of phthisis deaths over the "normal" level, 6 per cent. of 16,903 or 1014, was almost reached, the actual excess being 856 deaths. Examination of the total 6262 death certificates for tuberculosis of the respiratory system during these two epidemic months revealed a mention of influenza on 277, or about one in three of the additional deaths which were presumably brought about by the epidemic. (The excess of deaths attributed to phthisis calculated as due to influenza in the fourth quarter of 1918 was 3854, influenza being mentioned on 1619 of these.)

Table VI. shows that whilst the March quarters of the six low influenza years produced an average seasonal excess of 767 deaths over the mean of the preceding and following quarters, for the six epidemic years this excess was 1706 deaths. It also appears that whilst the September and December quarters following the epidemics had a deficiency of deaths averaging 1090 compared with the same quarters of the years with low influenza, the corresponding deficiency for the September and December quarters preceding the epidemics was only 507. This is no doubt due to the fact that influenza itself, or the secondary infections of the respiratory tract spread by those attacked by it, hastened the death of many phthisical patients who would otherwise have lived through another summer, thereby diminishing the deaths two or three quarters later to that extent. This compensatory effect is seen in phthisis mortality statistics for the period immediately following the pandemic of 1918–19 with its phenomenal phthisis mortality.

Tuberculous meningitis mortality shows in Table II. no evidence of any increase during influenza epidemics.

RESPIRATORY DISEASES (NOT TUBERCULOUS)

Deaths attributed to bronchitis, pneumonia, or other diseases of the respiratory system following upon or associated with influenza would be classified to a subgroup of influenza under the heading "influenza with respiratory complications," and would go to swell the total influenza deaths, but would not be included in the comprehensive group of respiratory diseases. If influenza was not mentioned they would be assigned to the respective respiratory diseases and the increase of these individual groups or of the total respiratory disease group during influenza epidemics represents deaths associated in some way with the influenza wave but not recognised, or at least not stated on medical certificates, as being caused or complicated by influenza.

Table II. shows that mortality from respiratory diseases as a whole (excluding those with mention of influenza, tuberculosis, and other primary causes such as measles) increased sympathetically with influenza from 72 to 126 per cent. of expectation in January, from 69 to 149 in February, and from 80 to 145 in March. The graphs in Fig. 2 indicate that this occurred at about the same rate in the warm as in the cold months, the effect of coldness being very small compared with the effect of influenza prevalence. Table III. shows that the mean monthly deaths from these causes progressively increased from 7445 in the ten months having less than 1000 influenza deaths to 17,405 in the worst epidemic month having over 11,000. In the same series of months deaths attributed to influenza plus respiratory disease rose from 490 to 9236.

From Table IV. it appears that whilst in the A group of normal months of the first quarter 64 per cent. of influenza deaths had respiratory complications mentioned, the proportion was 71 per cent. during mild or moderate epidemics and 76 per cent. during severe epidemics. (During the fourth quarter of 1918 the corresponding proportion was 86 per cent., and during the next quarter it was 83 per cent.) Of the deaths in excess of normal expectation during this last group of months, 78 per cent. had respiratory complications. For every 100 total influenza deaths in excess of normal there was, in addition to the 73 or 78 above mentioned (included in the 100) an excess of 80 deaths during ordinary epidemics or 95 during severe epidemics attributed to bronchitis, pneumonia, or other respiratory disease without mention of influenza. (The calculated proportions in the fourth quarter of 1918 and first quarter of 1919 were 20 and 38 per 100 respectively.)

Applying to the 1933 epidemic this expectation of 95 extra respiratory deaths to each 100 extra influenza deaths, Table V. shows the expected excess over the average for the corresponding months of the normal years 1928 and 1930 amounted to 16,058 respiratory deaths, but the total excess realised was only about half of this. By the alternative method in Table VI. in the six epidemic years the mean March quarter deaths amounted to 35,947 and the mean of the preceding and following quarters to 16,119, giving an excess, partly seasonal, of 1928, whereas for the other six years the corresponding excess, which we may regard as wholly seasonal, was only 7187. The difference of 12,641 accompanied a difference of 11,435 influenza deaths, or 111 to each 100. In 1933 the excess of March quarter deaths over the mean of the preceding and following quarters was 18,317 influenza deaths, or 16,792 more than in the low influenza years, leading to an expectation of an excess of 18,639 + 7187 = 25,826 respiratory deaths over the preceding and following quarters, whereas the observed excess was 15,205. The percentage of respiratory complications amongst the influenza deaths in this epidemic was, however, 77, the average proportion from preceding severe epidemic months being 76 (Table IV.).

Influenza is of course not the only factor concerned in producing monthly fluctuations in respiratory mortality, but it is undoubtedly the most important one under present conditions, the mean temperature having only a small effect in comparison, as Fig. 2. shows. Of the various respiratory conditions acute bronchitis shows the greatest sensitiveness to influenza prevalence, as also to coldness of the month in question (see Table II. and Fig. 2). Thus for January the mortality figure ranged from 65 to 144, for February from 66 to 193, and for March from 72 to 159 with rising influenza, a range similar to that of whooping-cough. Broncho-pneumonia is not quite so sensitive, and chronic bronchitis and asthma again slightly less. The close similarity of the "asthma" to the chronic bronchitis graphs in Fig. 2 is suggestive. All of these manifest a very high degree of association with influenza. Lobar pneumonia shows a much lower rate of increase, whilst pneumonia undefined gives graphs intermediate between lobar and broncho-pneumonia, approximating closer to the former than the latter.

A higher degree of association between the respiratory deaths and the influenza deaths is found to occur when the same months are associated than when influenza deaths in January are associated with respiratory deaths in February and so on, allowing a time lag of a month or more. Thus, if the Februaries are arranged in order of the influenza mortalities in the preceding month, the ratios of Table II. for respiratory diseases become 71, 86, 130, 117, instead of 69, 75, 111, 149, and for March arrangement in order of the preceding month's influenza produces the series 79, 87, 120, 123, instead of 80, 81, 103, 145.

TABLE VII

Results of Comparison with 1918–19 *expressed per* 100 *Influenza Deaths in Excess of the Normal*

—	1918 4th quarter	1919 1st quarter	1921–32. Severe epidemics.	1933. Jan.–Feb.
Influenza, excess of normal ..	100	100	100	100
Influenza without respiratory complications	14	17	22	22
Influenza with respiratory complications	86	83	78	78
Respiratory disease, so described, estimated as due to epidemic	20	38	95	44
Total respiratory disease due to epidemic	106	121	173	122
Ratio of this total to number of uncomplicated influenza deaths	7·6	7·1	7·9	5·5

Comparison with 1918–19 (Table VII.) indicates that the total increase in respiratory disease deaths during epidemics was seven to eight times the increase in uncomplicated influenza deaths, alike in 1918–19 and in the severe waves of 1922, 1927, and 1929, though in 1933 the ratio was lower. A great fall occurred, however, in the proportion of these extra respiratory deaths which were *stated* to be associated with influenza, from 83 per cent. (86 out of 106) in the fourth quarter of 1918 to an average of 45 per cent. in the later epidemics of 1922, 1927, 1929. In 1933, however, the proportion rose to 64 per cent., and it remains doubtful whether this fall represents a change in "fashion" of certification or a real change.

The accusation that the medical profession over-diagnoses influenza during epidemics receives no support from these figures, but it is unnecessary to conclude, either, that it is underdiagnosed, that is to say, that part or all of the extra deaths without mention of influenza did in fact result from a primary or complicating influenzal infection. If influenza is a virus disease and the respiratory complications result from secondary bacterial infections to which the respiratory tract is rendered more susceptible by the virus, presumably the secondary infection may be passed on to others after the virus has ceased to be transmissible, thus leading to contemporaneous waves of pneumococcal or other bacterial respiratory infections amongst persons who have escaped the influenza virus. This might also account for the rise in whooping-cough deaths, as suggested above.

HEART DISEASE AND "OLD AGE"

The graphs in Fig. 2 indicate a definite increase of deaths attributed to heart disease, without mention of influenza as a complicating cause during influenza epidemics, especially when these were severe and the weather cold. Table II. shows an increase from 90 to 110 for January, 84 to 133 for February, and 95 to 112 for March. This is evident, when no account of temperature is taken, for each heart condition in Table II., but separation of the cold from the warm months in Fig. 2 shows that for aortic disease the association with influenza is only apparent, being entirely explained by the consistently higher mortality in the colder months from this cause. The relation of sudden deaths to coldness of the winter months has been pointed out before.[5]

Mitral disease mortality is also affected by temperature, but shows an increase with influenza in the colder months. Table IV. indicates that to each 100 epidemic influenza deaths there were two deaths from mitral disease in excess of expectation during ordinary epidemics and three during the severe waves. Table VI. shows that in the 1933 wave there was an excess of 765 deaths from this cause over the average of the preceding and following quarters, compared with 687 in the six epidemic years between 1921 and 1932, and an average excess of 243 in six normal years, due to seasonal influences. On the basis of the influenzal deaths the anticipated excess of mitral disease deaths would be $243 + (18{,}317 - 1525)\ 444/11{,}435 = 895$, the actual figure being 765. There is no evidence from the Table that the increase during epidemics was followed by any such compensatory deficiency in succeeding quarters as was noticed for phthisis; mortality was enhanced during the half year after the epidemic rather than diminished.

The graphs for fatty heart closely resemble those for mitral disease. Deaths attributed to "myocardial disease" (other than acute myocarditis or fatty heart) have greatly increased in recent years, owing mainly to changes in fashion of certification of the deaths of old people. In 1923 they numbered 13,445 and in 1933 62,009. Satisfactory correction of mortality for this secular trend was therefore difficult, and the ratios in Table II. for this cause must be accepted with reserve, but they appear to show a similar degree of increase during epidemics as do the other heart disease groups. Table IV. shows that to each 100 "epidemic" influenza deaths there were not less than 71 additional deaths attributed to "other diseases of the heart or circulation" during mild or moderate epidemics, or 37 during the severe epidemics.

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[5] Stocks, P.: Brit. Med. Jour., 1928, ii., 1188; Arteriosclerosis: A Survey of the Problem (E. V. Cowdry, Editor), New York, 1933, p. 212.

Deaths attributed frankly to "old age" without any circumlocution have been steadily declining, but after correction for this secular trend, the mortality figures in Table II. closely resemble those for myocardial degeneration, and the curves in Fig. 2 are similar to those for fatty heart, showing the double effect of coldness and influenza, of which the latter was the more important. According to Table IV., to each 100 epidemic influenza deaths, 6 additional deaths were attributed to old age during ordinary epidemics, or 9 during severe epidemics, and Table V. shows that during the 1933 wave there was an excess of 753 deaths attributed to this cause over expectation from the normal months of 1928 and 1930. The calculated excess was greater than this, but the downward trend since 1928 to the passing out of fashion of this form of statement has not been allowed for in Table V.

OTHER CAUSES

Combining all causes other than influenza and respiratory diseases, mortality was affected to the extent of a rise from 95 per cent. of expectation during the Januaries of lowest influenza to 110 in the Januaries of highest influenza. For February the corresponding indices were 93 to 110, and for March 95 to 105. Fig. 2 indicates that, whereas at a given influenza level coldness was a factor which increased this mortality to some extent, influenza was a more important factor, especially during the colder months. Table V. shows that the anticipated excess of 13,859 deaths from this total group of causes during 1933 epidemic over the same "normal" months in 1928 and 1930 was almost exactly realised.

Diseases of the nervous system, excluding hæmorrhage into the brain, showed a slight rise with influenza, at any rate in the colder months (Fig. 2). Cerebral hæmorrhage, including the deaths attributed to arterio-sclerosis as primary cause, increased more definitely, and it appears from Table IV. that to each 100 epidemic influenza deaths from 7 to 13 additional deaths from cerebral hæmorrhage occurred, the proportion being smaller during the more severe epidemics in contrast to most of the other causes in the Table. The excess of deaths in the 1933 wave, 1333, agreed fairly well with the calculated excess (Table V.). Arterio-sclerosis without cerebral lesion also increased with influenza (Table II.).

Cancer, a disease which was given precedence over influenza when jointly stated with it, manifests no association whatever with either air temperature or influenza prevalence. During January and February, 1933, 10,697 deaths from cancer occurred, and for only 99 of these was influenza mentioned as a complicating cause. (In the fourth quarter of 1918 the proportion was 53 out of 10,633.)

Mortality from nephritis failed to rise consistently with influenza, although January and March deaths from acute nephritis and January and February deaths from the chronic form manifested a slight apparent association with it.

Puerperal sepsis and septicæmia also show, if anything, a negative association with influenza prevalence, and for other puerperal causes there is no consistent change. Premature birth mortality tends to be slightly enhanced during epidemics, as might be expected.

Digestive causes show no association, nor does suicide.

According to Table IV., to each 100 influenza deaths in excess of the normal level, about 180 or 190 additional deaths from all other causes are certified during influenza epidemics, respiratory conditions generally forming a somewhat larger proportion of these during the more severe epidemics, though in 1933 this was not true.

Examination of all the death certificates during January and February, 1933, for the causes usually taking precedence over influenza when jointly mentioned with it (those starred in Table V., syphilitic diseases, scarlet fever, intestinal obstruction, and a few other causes, but excluding suicide or accident) revealed a total of 482 deaths with mention of influenza, or about 1 in 48 of the total deaths from these causes. The total of 482 consisted of 22 whooping-cough, 277 phthisis, 99 cancer, 18 encephalitis lethargica, 17 syphilitic diseases, 10 non-pulmonary tuberculosis, 7 premature birth, 8 intestinal obstruction, 5 puerperal sepsis, and 19 others. It must be remembered that an ordinary attack of influenza more than two or three weeks prior to death from one of these causes would not usually be mentioned on the death certificate, so the above finding could only be taken to mean that about 1 in 48 persons living were attacked on the average in each two or three weeks during the two months, or about 1 in every 12 to 18 during the whole epidemic. The Scottish figures[6] for the insured population show that during the year ending June, 1933, 6 cases of influenza occurred to each 100 persons, which suggests that between 1 in 10 and 1 in 20 persons were attacked during the epidemic. The incidence rate recorded for the army in the United Kingdom in 1933, was 1 in 25. The prevalence suggested by death certification is therefore in reasonable agreement with such measures of the actual incidence as are available.

Summary and Conclusion

During the influenza epidemics of 1921–33, which occurred mainly in the first quarter of the year, monthly mortality certified as due to many other causes, without mention of influenza as a primary or contributory cause of death, increased step by step with the severity of the influenza mortality. The causes most remarkably affected were whooping-cough, acute bronchitis, broncho-pneumonia, chronic bronchitis, asthma, pneumonia not defined, lobar pneumonia, and pulmonary tuberculosis, but mitral disease, fatty heart, myocardial degeneration, old age, cerebral hæmorrhage, arterio-sclerosis, nervous diseases, and premature birth also showed pronounced increase of deaths during epidemics.

During moderate epidemics each 100 influenza deaths, so described, in excess of the number occurring during the same months in interepidemic periods, included 73 with respiratory complications, and was accompanied by 190 other deaths in excess of expectation, consisting of 80 from respiratory diseases (without mention of influenza), 13 from cerebral hæmorrhage, 7 from whooping-cough, 6 from "old age," 5 from pulmonary tuberculosis, 2 from mitral disease, 71 from other diseases of the heart and circulation, and 6 from other conditions. During severe epidemics each 100 influenza deaths was usually accompanied by rather more than the above proportion of deaths from the respiratory causes, offset by less from circulatory causes.

Whooping-cough showed the most phenomenal rise of mortality with influenza in proportion to its numerical importance as a cause of death, and it is suggested that either the double infection must be very fatal, and must generally pass unrecognised as such, or else the increased mortality must be due to the secondary respiratory infections being transmitted from influenza to whooping-cough patients.

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[6] Report on Incapacitating Sickness in the Insured Population of Scotland, 1932–33, Table V.

It is also suggested that the great increase in deaths from bronchitis and pneumonia (without mention of influenza) during epidemics need not indicate lack of precision in diagnosis, but may indicate contemporary waves of the secondary infections of the respiratory tract started by persons originally infected by the influenza virus. The heavy phthisis mortality was partly attributable to hastening of inevitable death from that cause, and to that extent was offset by diminished deaths in the latter half of the year.

There was no clear evidence of increase of infections of other parts of the body, and the large increase in deaths attributed to non-respiratory causes during influenza waves seems to require either (1) that there is a lowered state of resistance to many disorders at the time when the epidemics occur, or (2) that influenza as a cause of death is very often not diagnosed owing to the medical attendant not having been consulted in the early stages of illness but only when sequelæ have developed, or (3) that influenza though recognised as the initial cause is not mentioned as such on the death certificate.

After giving full weight to the possible alternative explanations, there can be no doubt that incomplete medical certification is partly responsible for the widespread diffusion of the increase in mortality during influenza epidemics over the list of causes, and particularly for the great increase in deaths ascribed to myocardial disease and old age. It was hoped that the introduction of a new form of certificate in 1927 would result after a short interval in a very definite improvement in the reliability of medical certification, but whilst this hope has been fulfilled in certain respects it has not yet been realised to the desired extent in other directions, especially with regard to the manner of statement of joint causes of death.

The writing of a satisfactory death record is often a matter of no small difficulty, and it is to be regretted that the representations made some six years ago that adequate instruction should be given to every medical student in the matter of death certification have not yet met with a wider response in the teaching schools. A considerable service can be rendered to the preventive medicine of the present and of the future by each physician, surgeon, or pathologist who endeavours to produce accurate and complete mortality and notification records, and time can surely be found even in an overloaded curriculum to impress this fact upon every student before training is completed.

MEDICINE AND THE LAW

Omission to Notify Infectious Disease

A DOCTOR was fined sums amounting (with costs) to £6 5s. at Daventry last month for failure to notify cases of infectious disease. The alleged offences related to dates in March, April, and June, and the solicitor who prosecuted on behalf of the rural district council stated that on Jan. 10th the doctor's attention was called to the necessity of notification. The medical officer of health gave evidence that no certificates had been received in respect of three scarlet fever patients, a certificate for a girl suffering from diphtheria was not received until after she had recovered and left hospital, and in another scarlet fever case, admitted to hospital on June 1st, notification was not received till June 18th. The doctor pleaded guilty. In extenuation it was said that he had been overworked at the time and that three of the cases came from households where previous cases of infectious disease had already been notified. It was suggested that in some districts it is the practice to regard the notification of a single case from a particular family or home as covering subsequent cases from the same family or home. The Public Health Acts give no support to such a practice.

Alleged Attempt to Commit Suicide by Starvation

At Blackpool police-court last week Mr. Davidson, the former rector of Stiffkey, was charged with unlawfully fasting "with intent feloniously, wilfully and of his malice aforethought, to kill and murder himself." Apparently the accused was exhibited in a cubicle at a wax-works exhibition with posters which described him as intending to starve himself to death if an adverse decision of the ecclesiastical court were not reversed and if he were not reinstated by the bishop. A police officer said that the accused was so weak after a fast of ten days that he had to be lifted out of the case. It was contended on behalf of the defendant that there was no evidence that in this ten-day period he had been in any danger of death. The magistrates thought there was a case to answer and committed him for trial at Preston quarter sessions, bail being allowed on the defendant undertaking that meanwhile he would not starve, pretend to starve, or exhibit himself in a cabinet.

The law against attempted suicide is variously enforced. There have been official announcements that in many cases the police take no action unless it is necessary in the interests of the accused. The "hunger-strike," undertaken for political motives or otherwise, has no immunity from prosecution. The motive of attempted suicide is immaterial.

IRELAND

(FROM OUR OWN CORRESPONDENT)

SWEEPSTAKE MONEYS

IN answer to a question addressed to him in the Dáil the Minister for Local Government and Public Health has given some interesting information about the money which has been distributed to the hospitals of the Irish Free State from sweepstakes funds and the money which awaits distribution. He states that there is at present in the hands of the National Hospital Trustees a sum of £4,050,778, to which is to be added approximately £354,835 derived from the sweepstake on the Derby of this year, not yet paid over. Beside these sums the Minister has in his own hands for distribution £433,177 obtained from sweepstakes held before the passing of the Hospitals Act, 1933. So far sums amounting to £3,703,080 have been distributed to the hospitals under various Acts. He added that a preliminary report has been submitted by the Hospitals Commission and is under consideration. There has been, and will be, no avoidable delay in carrying out the intentions of the Public Hospitals Act, 1933, but obviously the matter is one of such magnitude that its investigation will take time.

THE LATE DR. C. M. O'BRIEN

Dr. Christopher Michael O'Brien, who died in Dublin on August 5th, qualified from the Royal Colleges of Ireland in 1892 and 1893, and graduated as M.D. Durh. in 1900. Early in his professional career he became interested in dermatology, and was the first medical man in Ireland to practise that branch of medicine as an exclusive specialty. He founded the Skin and Cancer Hospital in Dublin while he was *still* a young man, and continued to conduct it up to the time of his final illness. He was one of the first in these countries to apply radium to the treatment of disease. A kindly and generous man he was held in much esteem by his friends and patients.

VIENNA

(FROM OUR OWN CORRESPONDENT)

REFORM OF THE MEDICAL CURRICULUM

THE reforms which the present authoritarian government is introducing into every branch of public life have now been extended to the universities, where the following new regulations will come into force next session. Each academic year is to consist of two semesters (or terms), the winter semester lasting from Oct. 1st to Jan. 31st and the summer semester from Feb. 15th to June 28th. Thus both terms will be of about the same length, whereas under the present system the winter term has been five months and the summer term only three months. The dates given mark the commencement of lectures for students. The Christmas vacation will be from Dec. 19th to Jan. 7th and the Easter one from March 16th to April 20th. Examinations and graduations (called here "promotions") will be held if necessary all the year round, except during the Christmas vacation and the summer vacation (July 15th to Sept. 20th) when all the universities will be closed. During these "free weeks" the students will be expected to take part in "university camping," which is a mild form of military training. Regulations for these exercises will be published shortly. Various special regulations are also made for the maintenance of hospital and ambulance services and of scientific work during the vacations.

Changes have also been made in the existing rules governing medical examinations, which have been in force since 1903. Medical students must henceforward pass three groups of examinations, each of which is termed a *Rigorosum*. The first rigorosum is passed in the fifth semester, and consists of natural science (physics), chemistry, physiology, histology, and anatomy. There will be theoretical (viva voce) and practical examinations in all the subjects except natural science, in which the examination will be purely theoretical. Biology has been dropped, and students who have already taken the first rigorosum but have failed in biology will not be required to sit again in that subject. The second rigorosum will consist of examinations in morbid anatomy and histology, pharmacology and dispensing, materia medica, pædiatrics, neurology, and psychology. Candidates will be examined theoretically and practically in all subjects except pharmacology and dispensing, for which only a theoretical examination is required. General and experimental pathology, which was formerly also included in the second rigorosum, has been dropped. The third rigorosum, taken after the eleventh semester, embraces all the other subjects of the medical curriculum (surgery, including orthopædics; obstetrics and gynæcology; ophthalmology; oto-rhino-laryngology; dermato-syphilology; hygiene and forensic medicine).

A novel feature in the new regulations is the clauses directed against unsuccessful candidates. Under the old regulations a candidate who failed in part of the first rigorosum was allowed to take the examination again several times if necessary. Now he is only allowed three attempts if he fails in one subject, and two if he fails in two or three subjects. Should he fail in four subjects he will not be allowed to continue the study of medicine in this country, nor may he later apply for registration in Austria on the strength of a foreign medical qualification. A candidate who has been unable to finish his first rigorosum within two years of first presenting himself for the examination will also be permanently excluded from medical study in Austria. Exceptions will naturally be made where the candidate is not responsible for the delay (illness, war). A candidate who has successfully passed all three examinations must apply within six weeks for "promotion" to the degree of "doctor universæ medicinæ." Otherwise he runs the risk of losing his turn and may have to wait for months before he is called up.

The idea of eliminating the less successful students during the course of their medical studies is by no means unreasonable. Its aim, of course, is to prevent students from embarking on a career for which they are not suited. The necessity of finishing their studies within a limited time will encourage undergraduates to concentrate on their work, and the majority of the profession approve of the new rule. The *sine qua non* is that the examiners deal fairly with the candidates, and this is certainly to be expected in Austria.

BIRTH-RATE AND INFANT MORTALITY

Changes in the population have shown the same trend during recent years in all the countries involved in the late war. After 1918 the birth-rate went up, only to fall again a few years later. In Austria in 1920 there were 137,372 live births, in 1921 there were 141,834 (an increase of over 3 per cent.), and in 1922 there were 150,958 (an increase of 7 per cent.). But that was the peak year, and the following Table for the next ten years shows a decrease of 40 per cent.:

Year.	Live births.	Year.	Live births.
1923	146,633	1929	110,171
1925	135,594	1932	102,254
1927	118,302	1934	90,934

Some countries have attempted organised measures to increase their birth-rates (premiums to families with numerous children), but here we have only one scheme of this kind: a premium of 120 Austrian shillings (£4 10*s.*) is paid for a live birth to mothers insured under the new Social Insurance Act. Attempts to bring down the infant mortality have however given satisfactory results. In 1920 it stood at 157 deaths per 1000 live births; next year it dropped to 154; and since then it has constantly decreased, as is seen from the following Table of mortality among infants up to twelve months old:

Year.	Total deaths.	Deaths per 1000 live births.	Year.	Total deaths.	Deaths per 1000 live births.
1923 ..	20,653	141	1930 ..	11,665	106
1925 ..	15,895	117	1932 ..	10,888	106
1928 ..	13,964	120	1934 ..	8,821	91

The rapid drop in the total number of deaths is of course due to the decrease in the birth-rate, but the drop from 141 to 91 deaths per 1000 births is undoubtedly satisfactory. The decrease is due to the work done by the executive committee for infant welfare instituted by the ministry for social welfare and public health. They began with 104 clinics which gave advice to mothers. A special scientific committee composed of the leading pædiatricians, directors of the local boards of health, and officers of the ministry investigated the problems of protection of mothers and infants against disease, and laid down general principles for the guidance of the clinics. It also assisted the local authorities in organising similar clinics all over the country, so that now we have 492 advisory centres with 78 branches and 13 antenatal clinics scattered over Austria. A staff of 515 doctors and 530 trained nurses is employed, and the expenditure for 1934 was 773,000 shillings (£30,000) and an attendance of 47,286 infants under eight months and 56,112 over eight months is recorded.

PANEL AND CONTRACT PRACTICE

The New Insurance Act Explained

JUST before Parliament rose Royal Assent was given to the National Health Insurance and Contributory Pensions Act, 1935, and on the same evening the Minister of Health broadcast an explanation of the chief features of the Act. It may be well briefly to recapitulate the principal provisions which affect the medical profession.

On ceasing to be insurably employed all insured persons are to have a free insurance period on an average of 21 months. During this period insured persons are to be protected for all pensions purposes and entitled to all health insurance benefits—medical, sickness and disablement, maternity, and additional benefits. If at the end of the free period an insured person who has been continuously insured for ten years, up to the date when he ceased work, proves that throughout the period he (or she) has been unable to obtain insurable work his insurance will be extended so long as unemployment continues to be proved year by year. During these periods of extended insurance he will be covered for all pensions rights and be entitled to medical, maternity, and additional treatment benefits, and will remain a member of his approved society. He will not be entitled to sickness and disablement benefit, but he can regain title to these benefits at the full rates if he again obtains insurable employment, although of course not immediately.

Under the Act of 1932 many insured persons have already ceased to be entitled to medical benefit and but for the passing of the new Act would have lost their pension rights at the end of 1935. These persons will be subjected to the ten years' test, but for the great majority of them the test will be applied at a much later date than that on which they ceased to be employed. If they satisfy the test they will be maintained in insurance so long as they continue to prove unemployment and, as from Jan. 1st, 1936, will be restored to medical, maternity, and additional treatment benefits and their pension rights will continue. Insurance doctors, especially those in the depressed areas, will thus have restored to their lists many of the insured persons removed under the 1932 axe. As from July, 1934, all arrears due to proved unemployment are to be excused in full; half the cost will be met by a levy on each contribution paid by members of approved societies and the other half by an annual Exchequer grant.

Hitherto deposit contributors have ceased to be entitled to medical benefit when their individual credit in the deposit contributors' fund becomes exhausted. In future, arrangements will be made to provide medical benefit for life to deposit contributors who are entitled to the benefit on reaching the age of 65, and they will thus be treated, for medical benefit, similarly to members of approved societies attaining that age.

Another anomaly which will be removed is in respect of a woman aged over 65 who marries. In the past such a woman, who otherwise would have been entitled to medical benefit for life, upon marriage was treated as having become a "Class K" member, and lost her title to medical benefit in about eighteen months.

Assistance at a Vaginal Operation

A west-country insurance practitioner assisted at an operation on one of his patients in which the cervix uteri was amputated and the vagina narrowed by stitches fore and aft. The insurance and local medical committees were in agreement that this assistance was of a specialist nature and that the doctor had the necessary skill and experience for its performance, but the Minister thought that it came within the doctor's terms of service and ordered an inquiry. On behalf of the two committees it was urged that the assistant at such an operation might be called upon to arrest a sudden hæmorrhage, or to hold the artery forceps or retractors in such a way as to enable the surgeon to get a clear view of the field of operation, and that many surgeons would prefer the ward sister as an assistant because of her greater familiarity with the task. It was further suggested that after years of absence from operating theatres some practitioners would not possess experience of modern operative procedure. A questionnaire had been sent to the 154 practitioners on the insurance committee's list to which 106 had replied, 48 of them being surgeons on the staff of their local hospital. Eight of these surgeons said they would be prepared to accept as an assistant at a major operation every insurance practitioner in the area from which his surgical cases were derived; the other 40 would not. Of the 58 other doctors who replied 25 would be prepared to act as assistant at a major operation—8 of them habitually act as such at all major operations performed on their insured patients; 33 would not be prepared to act; and 50 do not act as assistant at major operations.

The referees report that they are satisfied that the treatment in question did not involve the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess. They add that the fact that 40 of the 48 surgeons on the staff of their local hospital who replied to the questionnaire were not prepared to accept as an assistant *every* panel practitioner in their area is in their view irrelevant to the inquiry. The issue was whether general practitioners as a class can reasonably be expected to possess the necessary skill and experience, not whether every general practitioner possesses it or is thought by his fellow practitioners to possess it. The fact that 33 of the 154 doctors to whom the questionnaire was sent said they would not be prepared to act as assistant at a major operation was too vague without knowing what operation they had in mind. The reason why so few habitually did act as assistants at all major operations appeared to be because the hospital where the operation occurred was frequently outside their area.

While it must be remembered that the decision relates only to the particular case the observations can well be applied as a general principle.

A Remitted Penalty

A month or two ago (see THE LANCET, May 11th, p. 1129) the London local medical and panel committee investigated a complaint that a doctor had secured the transfer to his list of a patient of another doctor without the knowledge or consent of the insured person. The complaint having been found to be established it was necessary, under existing rules, for the committee to inform the Minister that the continuance of the doctor on the Medical List would be prejudicial to the service. Subsequently, however, it was felt that in the event of the Minister confirming the finding of the committee the penalty of removal from the list would be excessive. Only one such misdemeanour was alleged, and the complainant wanted to withdraw his representation provided the respondent sent a suitably worded undertaking not to offend similarly again. The respondent having now written expressing regret, and undertaking that there shall be no recurrence of the offence, the committee have decided (subject to a verbal amendment of the letter) to comply with the complainant's request.

It may be recalled that, after an investigation by its medical service subcommittee into any question relating to the conduct of a practitioner, an insurance committee may take action in any one or more of the following ways:—

(1) If they are satisfied that owing to the number of persons included in his list the practitioner is unable to give adequate treatment to all those persons, they may, after consultation with the panel committee, impose a special limit on the number of persons he may have included in his list.

(2) They may recover from him any expenses (other than those incurred in connexion with the medical service subcommittee's investigation) which have been reasonably and necessarily incurred by the committee or by an insured person or his representative owing to the practitioner's failure or neglect to comply with the terms of service.

(3) They may recommend the withholding of money.

(4) They may make representations for the removal of the practitioner's name from the medical list.

But it not infrequently happens that a practitioner is found to have committed an error of omission or of commission which is hardly of such a nature as to merit action under any of these four heads. It has become the custom for insurance committees in such cases either to warn the doctor of the necessity for a strict compliance with his terms of service, to caution him or to censure him. But it must be admitted that a censure is usually associated with action under (2) or (3) or both.

A Suspended Report and its Sequel

Committees are generally believed to have less compassion than their individual members. The recent action of a provincial medical benefit subcommittee reveals a very human touch; the pity of it is that the endeavours of the committee to help a doctor did not meet with success. In February last the committee investigated two complaints of failure to visit two persons on his list when requested to do so. The doctor admitted the failure which he ascribed to illness; he was, he said, undergoing a course of special treatment which would last five months. The committee decided to defer submitting their report on these two cases for six months conditionally upon the doctor undertaking to furnish at monthly intervals certificates (1) from the specialist providing the treatment that the doctor was following his directions (2) from a colleague that he was diligently carrying out his duties as an insurance practitioner. Article 33 (4) of the *Regulations* requires a medical service subcommittee to draw up a report and to present it to the insurance committee, but it does not specify when the report is to be presented, and there was nothing irregular in keeping the report in suspense to see how things turned out. Unfortunately the doctor failed to furnish the certificates required and it became necessary for the subcommittee to report that he had absented himself from his practice for longer than a week without first informing the committee as required by Clause 11 (2) of the Terms of Service, and to make a recommendation as to the action to be taken. The doctor then asked for leave to withdraw his name from the Medical List, and this was granted subject to an undertaking (which was given) that he would not, without the Minister's consent, engage in insurance practice as a principal.

PUBLIC HEALTH

Gas Heating of Flueless Rooms

THE tendency for houses to be built with some of the rooms unprovided with chimneys no doubt makes for economy in building—a matter of importance in these days when the costs of building are so high. The advisability, from a health point of view, of this practice is however a serious question which is so far from having been settled that the governor of the largest gas company in the world has induced the Royal College of Physicians to refer it to a committee of physiologists and public health experts. The conclusions so far reached by this committee have been made public, pending a final report. They refer only to conditions in dwelling-houses and not to those in factories and workshops.

At the outset the committee are faced with the fact that the rate of exchange of air in a room ventilated only by imperfectly fitting doors and windows, with or without the occasional air brick, is not really known with any precision; it is surmised that the air of such a room may be renewed from once in two hours to once in an hour, but whether this estimate is approximately correct, or whether even the higher rate presumed is sufficient to keep the room in a healthy and comfortable condition is not known. It is hoped by the committee that experimental work may be arranged on this point. With unventilated rooms the escape of heated air and the entry of cool air, which in cold weather needs to be heated, will be relatively small and therefore the amount of heating will be proportionately less than in rooms with chimneys or open windows; but the use in any room of flueless gas heaters, which discharge all the sensible heat and also all the products of combustion into the room itself, needs closer consideration when the ventilation is not very efficient.

Of the products of combustion of coal-gas water vapour may in some cases be beneficial in raising the humidity of dry air; it may be harmful if the air is already very humid. Carbon dioxide is harmless in any concentration likely to occur; carbon monoxide is not found in appreciable amounts in the gases from well-designed appliances kept in good condition. The only products likely in the opinion of the committee to be harmful in themselves are the oxides of sulphur and of nitrogen, the former derived from combustion of sulphur in the gas, the latter always found when air is heated sufficiently for oxygen and nitrogen to combine. A trained nose will usually detect the higher oxides of nitrogen in the air of a room overheated and underventilated when gas is the fuel (incidentally it may be mentioned that the same thing must occur with many electric heaters); the oxides of sulphur are less apparent, but sulphur trioxide probably accounts for the acrid dry smell of such rooms. Sulphur dioxide, which is the first product of combustion of sulphur, is just detectable when its concentration reaches 2 parts per million (volumes), and may be harmful if 10 parts are present, although this is uncertain.

The committee conclude that discomfort from overheating would be experienced before harmful concentrations of sulphur and nitrogen oxides were reached and the gas would be turned out or lowered. This conclusion seems to be based on sound common sense. The effect on metal work in rooms where the products of combustion are freely diffused was not within the committee's reference. It would probably be considerable.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 3RD, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1664; diphtheria, 883; enteric fever, 61; acute pneumonia (primary or influenzal), 436; puerperal fever, 36; puerperal pyrexia, 104; cerebro-spinal fever, 22; acute poliomyelitis, 30; polio-encephalitis, 1; encephalitis lethargica, 4; dysentery, 20; ophthalmia neonatorum, 114. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 9th was 2653, which included: Scarlet fever, 776; diphtheria, 958; measles, 32; whooping-cough, 426; puerperal fever, 23 mothers (plus 5 babies); encephalitis lethargica, 269; poliomyelitis, 7. At St. Margaret's Hospital there were 22 babies (plus 11 mothers) with ophthalmic neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever. 10 (0) from measles, 6 (2) from scarlet fever, 11 (2), from whooping-cough, 27 (2) from diphtheria, 56 (10) from diarrhœa and enteritis under two years, and 5 (0) from influenza. The figures in parentheses are those for London itself.

The deaths from diarrhœa and enteritis are little more than last week, the highest numbers being Birmingham 8, Liverpool 7, Manchester 5, no other great town more than 2. Of the 9 fatal cases of whooping-cough outside London 2 occurred at Birmingham; the others were widely scattered. Liverpool reported 4 deaths from measles, Sunderland 2. No great town reported more than 2 deaths from diphtheria.

The number of stillbirths notified during the week was 248 (corresponding to a rate of 36 per 1000 total births), including 30 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. K. H. Hole, O.B.E., to *Drake* for R.N.B.

Surg. Comdr. C. H. Savory to *Pembroke* for R.N.B.

Surg. Lt. D. W. Pratt to *Weston* and G. D. Wedd to *Victory* for Haslar Hospital.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. A. S. Pearson to *Victory* for R.N.B.

Surg. Sub-Lt. D. Shute to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Maj. H. G. Hobson, O.B.E., M.C., retires on ret. pay.

REGULAR ARMY RESERVE OF OFFICERS

The undermentioned having attained the age limit of liability to recall, cease to belong to the Res. of Off.: Lt.-Col. R. J. C. Thompson, C.M.G., D.S.O., and Majs. A. W. Howlett and H. T. Stack, O.B.E.

Capt. H. L. Oldershaw resigns his commn.

ROYAL AIR FORCE

Flight Lt. F. W. P. Dixon, M.B.E., to R.A.F. Depôt, Uxbridge; R. G. Freeman to R.A.F. Hospital, Cranwell; and H. J. Melville to R.A.F. Station, Boscombe Down.

Flight Lt. G. E. Church is promoted to the rank of Squadron Leader.

Dental Branch.—Flight Lts. W. D. Guyler to R.A.F. Depôt, Uxbridge, and B. L. Harrington to Home Aircraft Depôt, Henlow.

INDIAN MEDICAL SERVICE

Capt. E. G. Hurd-Wood to be Maj. (provl.).

Lts. (on prob.) to be Capts. (on prob.): J. Brebner, W. J. Virgin, H. W. G. Staunton, J. D. Gray, D. W. Taylor, P. H. Addison, C. U. Wickham (since decd.), March 11th, 1935, with seniority Oct. 25th, 1934; S. G. O'Neill, F. J. Doherty, J. W. D. Goodall, and C. B. Miller.

The undermentioned officers retire: Lt.-Cols. A. N. Thomas, D.S.O., H. W. Acton, C.I.E., and A. P. G. Lorimer (on account of ill-health).

Capt. K. C. Virmani relinquishes his temp. commn.

The undermentioned officer has vacated appt. in India:—

D.A.D.M.S.—Lt.-Col. P. S. Tomlinson, M.C., R.A.M.C., and has been appointed as Deputy Director of Medical Organisation for War.

The undermentioned appts. have been made in India:—

D.A.D.M.S.—Lt.-Col. G. F. Allison, M.C., R.A.M.C.

D.A.D.P.—Maj. C. Scales, R.A.M.C.

COLONIAL MEDICAL SERVICE

Dr. A. C. de B. Helme has been appointed Medical Officer, Tanganyika, and Dr. D. E. C. Mekie, Medical Officer, Malaya. Dr. H. P. Fowler becomes Senior Health Officer, Gold Coast; Dr. P. E. M. Lanier, Senior Medical Officer, Seychelles; and Dr. S. M. Vassallo, Senior Specialist Officer, Zanzibar.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The next series of post-graduate courses will begin in September: heart and lung diseases at the Royal Chest Hospital (Mondays, Wednesdays, and Fridays, 8 P.M., from Sept. 9th to 27th); pathological and clinical demonstration at the National Temperance Hospital (8 P.M., Tuesdays and Thursdays, Sept. 10th to 26th); infants' diseases at the Infants Hospital (Sept. 2nd to 13th); medicine, surgery, and the specialties at the Westminster Hospital (Sept. 16th to 28th); chest diseases at the Brompton Hospital (Sept. 23rd to 28th), and ophthalmology at the Royal Westminster Ophthalmic Hospital (Sept. 28th and 29th). The courses at the Royal Chest and National Temperance Hospitals are primarily, but not exclusively, intended for candidates for the M.R.C.P. examination. Other forthcoming courses include: anatomy and physiology (primary F.R.C.S.) at the Infants Hospital (8 P.M., on Mondays, Wednesdays, and Fridays, from Oct. 7th to Nov. 29th); endocrinology at the National Temperance Hospital (8.30 P.M., on Tuesdays and Thursdays from Oct. 8th to 24th); and gynæcology at the Medical Society of London (4 P.M., on Thursdays from Oct. 10th to Nov. 7th). Detailed syllabuses of all courses can be obtained from the secretary of the Fellowship, 1, Wimpole-street, London, W.1, within a few weeks of the starting date of each course. Courses of instruction, arranged by the Fellowship, are open only to members and associates.

OBITUARY

SIR JAMES PORTER, M.D. Aberd., K.C.B., K.C.M.G.

LATE DIRECTOR-GENERAL, MEDICAL DEPARTMENT, R.N.

WE regret to announce the death on Friday, August 9th, of Surg. Vice-Admiral Sir James Porter, a distinguished former director-general of the medical department of the Royal Navy. The event occurred at St. John's Lodge, Wakefield, at the age of 83.

James Porter was born in 1851 and educated at the Old Grammar School, Aberdeen, and the University of Aberdeen, where he graduated in arts in 1874 and in medicine three years later. Immediately on medical qualification he entered the medical service of the Royal Navy. He was first appointed in 1877 to the Mediterranean fleet, but later joined the troopship, *Orontes*, in which he served throughout the Egyptian war of 1882, obtaining the medal and Khedive's Star. In 1884 and 1885, on duty with the Royal Marine Battalion sent to the Sudan, he was present at the action of Tofrek (March 22nd, 1885) and received two clasps to his Egyptian decoration for services during the campaign. Following a year's home service in Chatham he proceeded to Bermuda in medical charge of the Naval Hospital, and in 1889 was appointed to the depôt ship at Portsmouth, at which time he was promoted staff surgeon. After a period of service in the Mediterranean he returned to Bermuda, holding now the position of medical officer to the dockyard there; at the expiration of this appointment he became senior medical officer of the *Britannia* at Dartmouth. Here Porter in his relations with the cadets earned an enviable reputation both for ability and for the helpful and kindly attitude displayed towards his young charges; at the expiration of his time on the *Britannia* he was promoted fleet surgeon. In 1889 occurred the South African war, and Porter saw much service as fleet surgeon with the Naval Brigade, was mentioned in dispatches, obtained the Queen's medal with eight clasps, and was specially promoted to the then existing position of Deputy Inspector-General of Hospitals and Fleets.

[*Photograph by Elliott & Fry*

SIR JAMES PORTER

The record of his service becomes now one of steady well-merited success. In 1901 he went to Haslar as second in charge; in the following year he was in charge of the Royal Hospital at Chatham, when he received the C.B.; and in 1905 he held the same appointment at Gibraltar; he was promoted Inspector-General in 1906, becoming two years later the head of his branch of the profession as Medical Director-General of the Navy with the rank of Vice-Admiral. In 1910 he received the K.C.B., and the year before the European war had retired from the active list, but on the declaration of hostilities he returned to the Navy for special duties at the Admiralty arising out of his long and practical experience in the working of the naval medical service. During the European war he served as principal hospital transport officer in the Mediterranean and the Dardanelles, and in 1916 was appointed K.C.M.G., having also received the Star and Allies medal and the Victory medal. This is the brief story of a distinguished national servant.

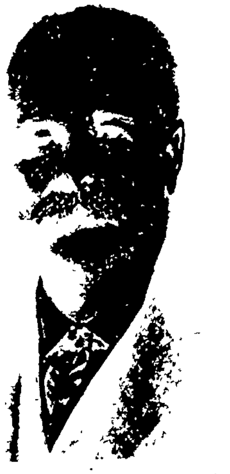
At different times in his career the quality of Porter's work was recognised without the limits of his particular service. He was honorary physician to the King, and a Knight of Grace of the Order of St. John of Jerusalem; his own university and the University of Edinburgh made him a LL.D., and he held the Coronation medal. He married in 1886 Emma, daughter of the late Inspector-General M. W. Cowan, R.N., by whom he had one daughter. He had been a widower for three years. He will be buried at sea.

WILLIAM THOMAS HOLMES SPICER, M.B. Camb., F.R.C.S.Eng.

CONSULTING OPHTHALMOLOGICAL SURGEON, ST. BARTHOLOMEW'S HOSPITAL

THE death occurred on August 8th at his house in Wimbledon of Mr. Holmes Spicer, the ophthalmologist, as well-known as an organiser and an authority on the teaching of his science as he was as clinical exponent. He was in his seventy-fifth year.

Holmes Spicer was born at Saffron Walden and educated at the school there, and later at Barnet, whence he proceeded to Cambridge. At first attached to no college, in 1879 he entered Gonville and Caius, and graduated in 1880 with honours in the Natural Science Tripos. He proceeded for his medical education to St. Bartholomew's Hospital, took the diploma of M.R.C.S. in 1884, the Cambridge M.B. in 1886, and the F.R.C.S. Eng. in 1888. At St. Bartholomew's he had a prominent career, being Bentley surgical prizeman and later Brackenbury surgical scholar. He was house surgeon and ophthalmic house surgeon to the hospital, and followed many distinguished predecessors in being president of the Abernethian.



[*Photograph by Lafayette*

MR. HOLMES SPICER

After a short period of general practice he decided to follow the specialism in which he created for himself a successful position. Following a clinical assistancy at Moorfields he was appointed ophthalmic surgeon to the Metropolitan Hospital and to the Victoria Hospital for Children, and did noticeable work at the latter institution in connexion with scurvy rickets, making communications on the subject to the Transactions of the Ophthalmological Society. In 1898 he was appointed surgeon to Moorfields, a position which he occupied for over 20 years; he was for a long period dean at the hospital, a post which he filled to admiration, the number of students mounting up as the organisation of the teaching, through Spicer and the staff, became perfected. In 1901 Bowater Vernon retired from his position as ophthalmic surgeon to St. Bartholomew's, and Walter Jessop succeeded him with Holmes Spicer as his junior colleague. Spicer was on the staff at St. Bartholomew's until 1920, when he retired under the age rule, but was appointed a governor of the institution and a member of the house committee in recognition of his valuable coöperation.

Spicer was a considerable author throughout the whole period of his hospital appointments, although he wrote no standard work on ophthalmology. He regularly contributed to the Transactions of the Ophthalmological Society, his articles covering a very large clinical area and displaying both physiological and practical wisdom. He wrote the article on the cornea in the Encyclopædia Medica, contributed to Posey and Wright's "Diseases of the Eye, Nose, Throat, and Ear," and edited the sixth edition of "Diseases of the Eye," by Nettleship, whom he had worked under and had succeeded at Moorfields. This edition appeared seven years after its predecessor. The original work dealt with the more common forms of ophthalmic disease and their characteristic symptoms, and laid down the broad principles of treatment, so that much revision might not be considered necessary, but Spicer greatly improved the work. In its new form descriptions of operations were simplified, statements not sanctioned by more mature experience were omitted, and new facts were added, making of the sixth edition of Nettleship's valuable manual a work thoroughly representing the state of ophthalmic knowledge at the day.

Spicer, who was twice married, leaves no children. In his leisure time, both while in practice and after retirement, Spicer painted, mainly in water-colour, and many may have seen his drawings privately or at exhibitions at the Royal Society of Medicine of work by medical artists. The portrait is reproduced from a photograph taken on his retirement from St. Bartholomew's.

Sir John Parsons writes: "The death of Mr. Holmes Spicer has bereft ophthalmologists of an esteemed colleague and a loyal friend. He brought to his work a sound knowledge of general science, acquired at that best of scientific schools, Cambridge; but in addition he was widely read in literature and history, and endowed with unusual artistic ability and outlook. Coming early under the influence of the most scientific teacher of his time, Edward Nettleship, any high flights of imagination and originality, of which he was fully capable, were coördinated and controlled by that stern but salutary taskmaster. With his gift of accurate draughtsmanship it was natural that his notes of cases should be profusely illustrated by sketches of abnormal conditions, often revealing to others the true nature of a case in a manner which verbal description alone failed to convey. He was specially interested in the innumerable types of corneal ulcer and opacity; and his Gifford Edmonds Prize Essay on 'Parenchymatous Keratitis,' &c., published as a monograph by the *British Journal of Ophthalmology*, embodied the work of a lifetime. It is enriched by many exquisite drawings and will ever remain a classical contribution to the subject. On holidays and in retirement he gave free rein to his artistic bent, revelling in the beauties of scenery and architecture, perpetuating many scenes with no mean skill. One such sketch, which he gave to me, has been highly praised by competent critics, and there is little doubt that, had he devoted his life to art, he would have attained a high position—but that would have been at the expense of his outstanding contributions to ophthalmology. It is difficult for one who is proud to claim the title of a friend to convey the charm of Spicer's personality. Of massive build and sedate demeanour, always unperturbed and somewhat slow of speech, he was full of kindliness and humour. It was a unique experience to travel abroad with him and witness his enjoyment of everything—including the 'good things' of life."

J. T. writes: "One who had been on terms of cordial and intimate friendship with him for more than 40 years may be permitted to add a few words to your tribute to Holmes Spicer. He was a big man physically, slow in his movements, but mentally very alert, with a quickness of observation which surprised one. It was a special pleasure to be on holiday with Spicer. The writer can look back on happy times in France, Italy, and Sicily with him and on many week-ends at Rye. The memory of these times is a very happy possession, and one can never forget the helpful and sympathetic care with which he conveyed back to London the friend suddenly seized with illness on one of those week-ends. Spicer's artistic gifts were much in evidence. His water-colours were his great pleasure, but in the writer's opinion his pencil sketches were even better, although he himself revelled in colours. He was very fond of music, and in early days singing was a pleasure to him and gave much pleasure to others. He was at his best among a few intimate friends when his genial presence, his keen sense of humour, and his inimitable reproduction of patients' tales combined to render an evening memorable."

WALTER GIFFORD NASH, F.R.C.S. Eng.

CONSULTING SURGEON, BEDFORD COUNTY HOSPITAL

THE death occurred on Friday, August 2nd, of Mr. Gifford Nash, one of the best-known provincial surgeons in the country and rightly recognised as a pioneer in more than one important direction of surgery.

Walter Gifford Nash was born in 1862 at the parsonage, Berden, Essex, the fourth son of the Rev. Frederick Gifford Nash. He was educated at the Gloucester Cathedral, and went for his professional education to the Middlesex Hospital, entering the medical school in 1882 with an entrance scholarship and other exhibitions. He took the English double qualifications in 1887, served as house physician, as house surgeon (under Henry Morris), and as obstetric house physician to the hospital, and in 1891, having been for a period house surgeon to the South Devon and East Cornwall Hospital, Plymouth, he obtained the F.R.C.S. Eng. In 1891 he went into practice in Bedford, much of his excellent work later being done in connexion with his appointment as surgeon to the Bedford County Hospital, although already he had made a mark by the original nature of contributions to this journal and elsewhere.

We owe to Mr. G. Gordon-Taylor the following summary of Gifford Nash's surgical career:—

"The death of Walter Gifford Nash has not only robbed Bedford and Bedfordshire of a great surgeon and a charming personality, but British surgery is also the poorer for the loss of one who made notable contributions towards its advancement. It was always difficult to realise in conversation or in coöperation with Gifford Nash that he had been practising for nearly half a century, and that his earliest contribution to the columns of THE LANCET was made as long ago as June 21st, 1890, a number which also contained one of David Ferrier's Croonian lectures on cerebral localisation and the second Report of the Hyderabad Commission on chloroform.

"Gifford Nash commenced to practise when much of the surgery of the abdomen was still in its infancy. In 1887 Frederick Treves had performed the first deliberate appendicectomy, and Nash, embarking only two or three years later upon his own earliest appendicectomies, lacked the good fortune to have actually witnessed the operation carried out by another surgeon. It was not otherwise with gastric surgery; for Nash's earliest operations on the stomach, performed in the early nineties, were not modelled on anything observed in the theatres of other operators; he had to direct his own skilful hands. He was not long behind Sir Arbuthnot Lane and Sir Charles Ballance in successfully operating for infective thrombosis of the lateral sinus and ligaturing the internal jugular vein for this condition. One of his earliest contributions to surgical literature dealt with torsion of the undescended testicle, and although Nicoladoni had drawn attention to this complication in a foreign journal in 1884, Nash was the first British surgeon to describe the condition in a short paper in THE LANCET of June 6th, 1891. Not only can priority among British surgeons be claimed for him in recording this complication of the undescended testis, but he later recorded cases in which he was actually able by manipulation to successfully untwist the torsion, while he made other contributions to the literature of this subject. He seems to have had almost a flair for encountering the unusual in the surgery of that now-distant period, and his writings refer to such variegated activities as a successful nephrectomy for a pyonephrosis of the left half of a horseshoe kidney in an infant of 16 months, and the successful removal of a torsion of the testis in an infant 9 days old; he dealt successfully with a case of acute pancreatitis only five years after Fitz's classical description of that disease in 1889, and also with such a rarity as a primary hyperplastic tuberculosis of the stomach and duodenum.

"While his house surgeoncy to Sir Henry Morris in 1887 naturally led to a sustained interest in the problems of renal surgery, his surgical apprenticeship within the walls of Middlesex Hospital, when Bland Sutton was unravelling the pathology of ectopic gestation and indicating its surgical treatment, doubtless stimulated his enthusiasm for the surgery of this condition and may have been responsible for the numerous papers on this subject that frequently came from his pen. In the problems of cancer he also took a close interest. In 1902, as president of the South Midland Branch of the British Medical Association, he delivered an address containing much of interest in connexion with 'cancer houses,' 'dual cancer,' and other points dealing with the ætiological aspect of the disease.

"Nash's wealth of surgical experience was immense, and any appeal would always result in his unburdening himself of an abundance of information germane to the question at issue and of value to the interrogator who sought his advice and aid. He had capable hands and profound judgment; he inspired confidence everywhere, no less in the houses of the rich than in the cottages of the poor; he radiated enthusiasm amongst those who were his colleagues in the work of his life."

The interests of Gifford Nash were very wide and in all of them his energy and enthusiasm were displayed. In connexion with the Bedford hospital the County Guild was his conception and he was vice-president from its foundation nearly 30 years ago. He took a deep interest in the successful development of the Workers' Hospital Fund, another movement where he functioned as vice-president, and he was chairman of the convalescent home committee from its inception to the end of his life. In the development of the paying wards and the maternity department of the hospital he took a keen interest. Mr. J. A. Whitchurch, chairman of the managing board, in paying tribute to his activities, said that in the early years of the paying wards nearly two-thirds of the patients were under Gifford Nash's care, closing with the words, "For the last 23 years one of my most treasured experiences is the friendship, help, and advice of one I honoured and loved, a great surgeon, and a great gentleman, Walter Gifford Nash."

Mr. Gifford Nash married Miss Catherine Moore Wilson, daughter of the late Mr. Walter Wilson, of Plymouth, who survives him with six children, among whom are Mr. F. W. G. Nash, F.R.C.S., and Captain H. K. G. Nash, R.A.M.C.

ARTHUR SHILLITOE, M.B., B.Chir. Camb., F.R.C.S. Eng.

THE death has been announced of Arthur Shillitoe a well-known authority both on syphilis and life assurance problems. Born in 1860, he was educated at Cambridge, where he graduated as M.B., B.Chir. in 1894. He went for his clinical training to Guy's Hospital, and took the English double qualification in 1893, proceeding to the F.R.C.S. Eng. two years later. At Guy's he acted as assistant demonstrator of anatomy, and his first appointment showed the direction which his work would take and which was hereditary, for he became assistant surgeon to the London Lock Hospital and surgical registrar. While at the hospital he made many communications to medical societies and to the medical press, notably an investigation of a series of cases of pseudo-chancre which was published in these columns on May 30th, 1896. This communication made while Shillitoe was registrar at the Lock Hospital was mainly founded on observations made by his father in private practice, and the information as to recurring chancres supplied in this

[Photograph by Elliott & Fry

MR. SHILLITOE

paper was of a valuable nature, pointing to the elucidation of frequent difficulties in diagnosis. Later he collaborated in the production of D'Arcy Power and J. K. Murphy's "System of Syphilis," to which he contributed the section dealing with the primary lesions and early secondary symptoms of syphilis as seen in the female. In 1904 we published an article by Sir Arthur Keith, then lecturer on anatomy at the medical school of the London Hospital, and Shillitoe on the preputial glands of man, in which the embryological side of the subject was fully dealt with. Shillitoe was medical officer to the Atlas Insurance Company, and out of his experience arrived at certain conclusions on the relation of syphilis to life assurance which he published in the Transactions of the Life Assurance Medical Officers' Association in 1906. Thus in many directions he furnished the profession with practical knowledge in circumstances where exact diagnosis was of the first value.

Shillitoe had retired from active work for some time, and his death occurred suddenly in a Plymouth nursing-home on July 22nd.

DR. AMREIN

THE death in Zurich on August 2nd of Dr. Otto Amrein will be noted with regret by all who are interested in the climatic treatment of pulmonary tuberculosis. He was 62 and suffered from cardiosclerosis. Amrein's life coincided with the rise and decline of Arosa as an invalid resort. When he settled there shortly after qualifying in medicine at Zurich Jacobi's big German sanatorium had already been going for some years, and Dr. Roemisch, who is still living in retirement, was seeing most of the private patients who had begun to flock to the village of Arosa as an alternative to the more sophisticated town of Davos. Rüedi had taken with him a considerable clientele when he left Davos for Arosa, but did not long survive to enjoy it. Amrein's success was assured from the start; he was a first-rate clinician, cautious and sagacious, and with the personal qualities that retain the patient's confidence through months or years of monotonous life—for it must be remembered that sanatorium régime in the early years of the century was simply the application of hygienic-dietetic principles with no daily diversions such as artificial pneumothorax or gold injections. For twenty years or so Amrein was content with supervising his large practice in hotels and pensions, over the management of which his position enabled him to exert a controlling influence; but in 1914 was opened the sanatorium Altein in which was embodied every item of comfort and equipment designed for the kind of life he wished his patients to live. Circumstances combined to prevent it ever becoming the success he hoped. The death of a prominent financier, when it was half built, deprived it of the architectural features which would have made it a joy to behold as well as to live in, and the war gradually stemmed the flow of foreign patients, although later on the Red Cross was glad to find such a chance for its invalided officers. As the economic situation in Europe darkened one sanatorium after another in Arosa had to close its doors for patients, opening only for a month or two in the winter for sport. Through all these vicissitudes Amrein was the daily guide and counsellor of hundreds of phthisical English patients, many of whom owe him the health they now enjoy. He was always on the side of prolonged bodily rest, although he learnt that it was possible to make exceptions for the Anglo-Saxon temperament. He was immensely respected and a little feared by his colleagues, and consulted by the local authorities in every matter touching the place as a health resort. His familiar figure, with the slight limp which never interfered with his activities, will be much missed. If he had not been a doctor Amrein could have easily made his mark as a musician, for he was a pupil of the great Joachim, and continued throughout his life to take part in charitable concerts.

PHILIP JOHN LE RICHE, M.R.C.S. Eng.

THE death occurred on July 27th of Dr. P. J. Le Riche, who had been in practice before his retirement for some 30 years in Worthing. He was born at St. Heliers, Jersey, in 1863, the son of Mr. F. J. Le Riche, and he was educated at the Victoria College, Jersey, and University College, London, receiving also some of his medical training at Guy's Hospital. His first bent was towards ophthalmology, and he acted as an ophthalmological assistant at Moorfields, but later he made several voyages as surgeon to a steamship line. He then set up in practice at Worthing, and at the outbreak of war was in charge of The Grange auxiliary hospital, Worthing, and held also a captain's commission in the 4th Battalion, the Royal Sussex Regiment (T.A.). After the war he continued to practise in Worthing and became widely known both as a doctor and for various other activities. He was a useful local cricketer, was prominent in masonic circles, and under the name of "Kish" wrote a book called "Creation's Dawn," which attracted considerable public attention. Dr. Le Riche had for many years been a widower.

HOSPITAL COÖRDINATION IN LONDON

THE London Voluntary Hospitals Committee and the London regional committee of the British Hospitals Association have amalgamated under the title The Voluntary Hospitals Committee, County of London. The new committee represents both the governing bodies and the medical staffs of the 108 voluntary hospitals in the county of London, and will continue the consultations which have been taking place between the L.C.C. and the Voluntary Hospitals Committee since 1930, under Section 13 of the Local Government Act, 1929. A subcommittee has been appointed to meet representatives of the hospitals and medical services committee, L.C.C. The new committee will be an integral part of the B.H.A., and its functions will include the consideration of all subjects which may affect the voluntary hospitals within the county. The honorary officers are: chairman, Mr. Oliver N. Chadwyck-Healey; vice-chairman, Dr. A. M. H. Gray; treasurer, Sir Herbert Samuelson; secretary, Prof. Leonard S. Dudgeon.

KING GEORGE HOSPITAL, ILFORD.—Figures issued by the King Edward Hospital Fund for London show that out of a group of twelve hospitals with from 12 to 200 beds, this hospital was the only one with no available beds vacant, and the cost of maintenance per bed is less than the average. Income and expenditure for the first half of the year show the total income to be £14,000, as compared with £12,593 in the first half of 1934, and the expenditure was £18,509, an increase of £2962.

CORRESPONDENCE

TOXICITY OF AVERTIN

To the Editor of THE LANCET

SIR,—The report by Dr. Cole in your issue of August 3rd, and the letter from Sir Francis Shipway in your last issue, prompt me to record an example of the value of avertin. In August, 1932, two boys, brothers, aged 12 and 9, were admitted to the Dorset County Hospital suffering from meningitis, the organism of which was stated by the pathologist to be Pfeiffer's bacillus. Both boys were treated with continuous avertin anæsthesia, and apart from the initial lumbar puncture for diagnostic purposes, no other treatment was adopted. Full doses of avertin were given, three or four times in each 24 hours. These would cause the children to sleep for four or five hours; the head retraction disappeared, and there was no crying. It was possible to feed the children while they were coming round from the anæsthesia, though, in addition, fluids were given by the rectum. When the anæsthesia passed off, the heads of the children would retract, and they would begin to cry, and occasionally to scream.

After four days the younger child recovered sufficiently to stop the avertin, and in a week we were able to do the same with the brother. Recovery was complete, except for deafness in the older child, which persisted for a further week, and then cleared up completely.—I am, Sir, yours faithfully,

R. E. HOPE SIMPSON.

Beaminster, Dorset, August 9th.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—Dr. Thaysen's article has served to arouse my interest in two cases which have shown symptoms similar to those he describes. In both cases the following features were common:—

1. The attacks were of uniform severity and of constant duration, each attack lasting about 5 minutes.
2. The pain was gnawing and cramp-like in character, and was neither preceded by nor followed by tenesmus or flatus.
3. The pain was localised in the rectal region immediately above the sphincter ani.
4. The attacks disappeared spontaneously and were followed by feelings of exhaustion and lassitude, and in both cases resulted in the development of an anxiety state. They were unaccompanied by any disturbance of intestinal function.
5. Rectal examination digitally and per sigmoidoscope failed to reveal any causation for the attacks, and during an attack there was no spasm of the anal region.
6. No method of treatment was of any avail.

In both these cases the attacks came on within a period of 30 minutes following masturbation, and depended, I suggest, upon venous engorgement following sexual excitement.

I am, Sir, yours faithfully,

WILLIAM BLYTH.

The Mental Hospital, Riccartsbar, Paisley, August 10th.

To the Editor of THE LANCET

SIR,—As a sufferer from this complaint for a quarter of a century may a humble member of the profession venture to offer an opinion on what seems to puzzle his betters? I first experienced the affection after rashly leaving off my natural-wool underclothing in a bleak April spell. Since then I can always tell the prevalence of an east wind by my own feelings and without looking at the weather. As to treatment, I have always got relief from guaiacum and sulphur in tablet form, but whether it is the sulphur or the guaiacum that is the specific I cannot say. What I do claim is that the trouble is a neuritis, and I have read in Hilton's "Rest and Pain" (I cannot at the moment find the reference) that there is no less reason why the rectum should be subject to neuritis than any other part of the body. At first I feared *everything* including cancer as the cause and consulted a surgeon, but he could find nothing amiss locally, and anyhow I am still alive!

I am, Sir, yours faithfully,

August 9th. A SEPTUAGENARIAN.

PRURITUS

To the Editor of THE LANCET

SIR,—I have read and appreciated Lord Horder's address printed in your last issue. My own view is that X radiation should be regarded as a useful method of desensitisation in these cases. As Lord Horder has so aptly stressed, it is the underlying general ætiological factors which must be discovered and remedied. Failure in this direction will inevitably lead to a recurrence of the pruritus when further desensitising doses of X rays will give at best but temporary relief. In my experience cure may be effected in more than 50 per cent. of cases, and I do not believe "heavy doses" to be ever necessary.

I am, Sir, yours faithfully,

Putney, S.W., August 13th. WARNER COLLINS.

SIGNIFICANCE OF PERSISTENT HIGH BLOOD PRESSURE

To the Editor of THE LANCET

SIR,—Dr. L. N. Jackson's article in your issue of August 10th is most interesting, but I should like to join issue with him on one point. He states that patients with essential hypertension do badly on insulin. Surely this is too sweeping? Indeed diabetic accumulations in the blood probably contribute to the production of arterio-sclerosis.

I have now under my care 11 diabetics who are the subjects of persistent high blood pressure and have taken insulin for periods varying from eight months to six years with no ill-effects. All are over 55 years of age, and four are over 70. The systolic blood pressures range from 180 to 280 mm. Hg and the dose of insulin from 10 to 60 units a day. One patient has been able to leave off insulin owing to increased tolerance for sugar, and two have reduced it.

I believe that diabetics with high blood pressure derive nothing but benefit from insulin. Whether hypoglycæmia is harmful is another question. Joslin and others consider it dangerous in cases of angina pectoris and arterio-sclerosis, and it is reasonable to suppose that a reduction of the sugar content of blood passing through narrowed coronary arteries may fatally starve the heart. In my own patients with hypertension, the lowest point found during routine examination of the fasting blood-sugar was 0·08 per cent.—on the border line of hypoglycæmia—but one patient had an attack of hypoglycæmic coma when on holiday, and returned home apparently none the worse.

It seems unjustifiable to withhold insulin from diabetics with high blood pressure, either on theoretical or practical grounds; although when there is reason to suspect coronary arterio-sclerosis it is well to avoid hypoglycæmia.

I am, Sir, yours faithfully,

Hove, August 13th. G. M. WAUCHOPE.

POOLED HUMAN MILK FOR INFANT FEEDING

To the Editor of The Lancet

Sir,—In your annotation last week on pooled human milk for use in the feeding of premature infants and for babies suffering from alimentary disturbances, you report the doubt that Prof. W. Catel of Leipzig has thrown on its value. He has found that the mortality and morbidity of prematures is higher when the breast milk given is sterilised by heating than when it is given fresh. By this and other work he has been led to challenge the value of sterilised human milk.

It would be a pity to leave the matter at this point. The lesson to be learned from his observations is that sterilisation of breast milk by heating results in a reduction of those antibodies on which much of the comparatively high (passive) immunity of breast-fed infants depends. This is exactly what one would expect. Clearly the problem is to know how pooled human milk can best be stored so that deterioration does not occur. Some of your readers may like to know that breast milk, after being collected aseptically, may be stored at −10° C. in a refrigerator. In centres where this method is followed the milk, frozen solid, seems to keep indefinitely, and satisfactory results are obtainable by its use. This does not diminish the value of Prof. Catel's comparison between heated and fresh breast milk; indeed the evidence he reports of the deleterious effect of sterilisation by heating gives force to the argument in favour of low-temperature storage.

I am, Sir, yours faithfully,

Reginald Lightwood.

Brook-street, W., August 13th.

DR. GRIFFITH EVANS

ON HIS HUNDREDTH BIRTHDAY

In celebrating the centenaries of distinguished medical men we are seldom able to enjoy their presence among the celebrants. The hundredth birthday of Dr. Griffith Evans therefore gives peculiar pleasure to his colleagues and successors, and they are glad to recognise his services in two branches of medical work, for he is not only a graduate of medicine but also, and primarily, the Father of the Veterinary Profession in this country.

Dr. Evans was born at Towyn in Merioneth on August 7th, 1835, and qualified from the Royal Veterinary College at the age of twenty. He obtained a commission in the Army in 1860, and while stationed at Montreal paid a memorable visit to the armies of the North in the American Civil War, receiving his authorisation in a personal interview with Lincoln. The thesis which gave him his medical degree at McGill University in 1864 is said to have recognised the infectious nature of tuberculosis and emphasised the desirability of open-air treatment. Service in India followed, and in 1880, when he was inspecting veterinary surgeon to the Government of Madras, he made the investigations on surra which have won him lasting repute. Surra is a troublesome disease of horses, mules, camels, and cattle, occurring in India, Burma, Indo-China, and North Africa, and in discovering the causal organism Evans was also demonstrating, for the first time, that trypanosomes are capable of causing illness. He showed that the *Trypanosoma evansi* of surra is transferable by subcutaneous injection and by passage into the stomach, and his observations were permanently commemorated when Steel gave the organism its present designation. The other species or variety which bears his name is *Filaria sanguinis evansi*, isolated in 1882 from the blood of camels.

Dr. Evans retired from the Army in 1890, and before going to Bangor lived for some years in Cardiff where his daughter, Dr. Erie Evans, was in practice, and where he later renewed old acquaintance with Sir William Osler. His services to veterinary medicine have at various times been recognised by the conferment of the honorary degree of D.Sc. by the University of Wales, the Steel medal of the Royal College of Veterinary Surgeons, the Mary Kingsley medal of the University of Liverpool, and the freedom of Bangor.

On his hundredth birthday Dr. Evans was confined to his room, for he has lately fractured both thighs; but he was able to entertain a series of visitors bearing messages of congratulation. First among them were members of his own family, including Dr. Evans and Mrs. Garfitt (daughters), Miss Garfitt (niece), Mr. and Mrs. G. H. Jones (son-in-law and daughter), Mr. Evans (son), and Mr. Bevan Jones (grandson). Sir Frederick Hobday, Captain W. H. Savage, and Mr. W. T. Rowlands represented the veterinary profession, and Sir Frederick brought a congratulatory scroll from the Royal Veterinary College signed by the Duke of Gloucester as president and himself as principal. In accepting this scroll Dr. Evans expressed his gratitude at receiving it from the College where he began his professional career and spoke of the benefits he had received from his teachers there—notably Spooner, Simmons, and Morton. Recalling his early adventures in microscopy he told how he had made slides of blood—his own and that of animals—under different conditions of fasting and digestion. "I was the youngest student at College," he said, "and I was a ruminating animal!"

Telegrams were then delivered from the King and Queen, the Prince of Wales, the Royal College of Veterinary Surgeons, the Liverpool School of Tropical Medicine, the Welsh National School of Medicine, and other bodies. The mayor and town clerk of Bangor brought an address from the city council, and Dr. Evans warmly thanked them for expressing the friendship of "the people amongst whom I have lived." A message from Mr. Lloyd George, his fellow freeman of Bangor, referred to the pride felt by the Principality in Dr. Evans's lifework.

White Sticks for Blind Persons.—Just before the House of Commons rose Sir Ian Fraser asked the Minister of Transport if he was aware that more than 4000 blind persons have purchased or been given white walking-sticks for use when walking alone to indicate to motorists that they were blind; and if he would help to make the significance of these white sticks more widely known among the motoring public by giving instructions that a query with regard to them should be included in the driving tests now being given, and by including a reference to them in any future editions of the highway code or other propaganda which he might issue.—Mr. Hore-Belisha replied: I have tried to assist the object which my hon. friend has in mind, and I have let it be known that the carrying of white sticks by the blind has my approval and support. I am always ready to advance the project to which my hon. friend refers by any means open to me and it will certainly be relevant to consider, when the highway code comes to be revised, whether it would be appropriate to include advice on this subject. On the other hand, it should be borne in mind that there are certain possible objections to this course; for example, blind people might rely too much on their sticks, the sticks might be used by people who are not blind, and people who are blind or nearly so and did not wish to use the sticks might be prejudiced in the event of an accident.

MEDICAL NEWS

Westminster Hospital Medical School

The annual dinner of old students of this school will be held on Saturday, Sept. 28th, at the Trocadero Restaurant, Shaftesbury-avenue, London, W., when the chairman will be Dr. Vivian Orr. On Sept. 28th and 29th a morning course of lectures open to all medical practitioners will be held at the school. On Monday, Sept. 30th, Major Ian Hay Beith will deliver the inaugural address at the Caxton Hall, S.W. He will speak on the Privileged Profession.

Society for Provision of Birth Control Clinics

A lecture on the theory and practice of contraception will be given by Dr. Gladys Cox on Friday, Sept. 13th, at the Walworth Women's Welfare Centre, at 6 P.M. At the centre demonstrations will be given at 6 P.M. and at 7 P.M. on Friday, Sept. 20th, and at the same hours on Friday, Sept. 27th. The fee for the lectures and demonstrations at the centre is 5*s.*; they are open to medical practitioners and to students who have completed their gynæcological course, and those wishing to be present are asked to signify at which of the alternative hours they wish to attend. The address of the society is 153A, East-street, Walworth-road, London, S.E.17.

Post-graduate Courses in Berlin

An introductory course on homœopathy will be held from Oct. 14th to Nov. 9th by the Berlin Academy for Post-Graduate Medical Study. Other courses will include diseases of the throat, nose, and ear (Sept. 30th–Oct. 12th); infectious disease (Sept. 30th–Oct. 5th); internal medicine (Oct. 7th–19th); eugenics (Oct. 7th–12th); tuberculosis (Oct. 21st–26th); and surgical treatment of intrathoracic diseases with special reference to pulmonary tuberculosis (Oct. 28th–Nov. 1st). Special courses in all branches of medicine, with practical work, are held every month. Further information may be had from the Academy at Robert Koch-Platz 7 (Kaiserin Friedrich Haus), Berlin, N.W.7.

King's College Hospital

Mrs. Kate Madders, M.B., has been awarded a Halley Stewart fellowship in order to continue investigations under the direction of Dr. R. D. Lawrence in the diabetic clinic of the hospital.

Bromley Hospital

The building of the £35,000 extension at this hospital has now begun. Two new wards are being added, a massage department provided, and the nurses' home extended.

Three Counties Hospital, Arlesey

A new nurses' home to house 102 nurses is to be built on the hospital estate. The estimated cost is over £24,000, and the three counties Bedfordshire, Hertfordshire, and Huntingdonshire have been asked to approve the scheme so that building may begin before the winter.

Crewe Memorial Hospital

The foundation-stone of a new women's ward has been laid at this hospital. The ward will complete the extensions embarked upon a few years ago. Last year 784 patients were treated and the cost of maintenance was over £5000.

North Devon Infirmary

There has been a large increase in expenditure at this institution, mainly due to alterations and repairs, but the building is now in a good state of repair. Ordinary income amounted to £5365, a decrease of £278. Patients' payments were down by £269, and contributory schemes showed an increase of £265.

Derbyshire Royal Infirmary

In less than fifteen months £43,000 has been subscribed towards the £90,000 needed for the new ward block at this hospital.

Manchester public health authority has decided to organise a joint advisory board for the purpose of securing greater coördination and efficiency among the hospitals in the area.

Mr. Leslie Paton has been elected an honorary member of the American Medical Association.

Tewkesbury's New Hospital

This hospital, which has been built at a cost of about £9000, was opened recently.

Putney Hospital for Incurables

The Duchess of York has opened a new nurses' home at this hospital. The home has been needed for some time but funds were lacking. About £10,000 is still wanted.

Hull Royal Infirmary

This institution has had a deficit for six successive years and the accumulated debit balance is now over £28,000. Annual subscriptions and donations are lower than they were five years ago, while the infirmary's accommodation and expenditure have increased by 35 per cent.

Cardiff Royal Infirmary

A ward has been named after Sir William Diamond, the chairman of this institution, in recognition of his 15 years' service to it. When he became chairman the bank overdraft was £70,000, which has since been wiped out.

Sequel to a Pilgrimage

Thirteen cases of enteric fever are reported from Glasgow and neighbouring counties about three weeks after the return of pilgrims from Lourdes, and it is suggested that infection occurred somewhere on the journey. A case at the Fazackerley Hospital, Liverpool, is also attributed to the same journey.

Gallipoli and Salonika Revisited

Those who served in the Near East during the late war will be interested to learn that a reunion pilgrimage cruise to Gallipoli and Salonika has been arranged by a committee of ex-Service men. Those taking part will leave Liverpool in the *Lancastria* on May 1st, 1936, returning on the 23rd, and calls will be made at Malta, Gallipoli, Salonika, and Istanbul. Particulars may be had from the Joint Hon. Secretaries, Gallipoli and Salonika Pilgrimage Committee, 3, Shaftesbury-avenue, Chesterfield. Early application is advised.

AN EDINBURGH LABORATORY

IN his latest annual report as curator Sir Robert Philip shows that valuable work is continuously in progress at the laboratory of the Royal College of Physicians of Edinburgh. Over 15,000 pathological and biochemical reports were issued in 1934, including 3468 histological reports most of which were for the determination of malignant growth. Of late years the reports of tumour growths have been collected for investigation, and a "cabinet gallery of tumours" has been formed which includes some notable special collections—for example of bone sarcomata and tumours of the brain. This collection has been of special value to the Cancer Control Organisation for Edinburgh and the South-East of Scotland, and specimens of special tumours have been sent to several centres both in this country and abroad. The Cullen prize has been divided between Lieut.-Colonel A. G. McKendrick, superintendent of the laboratory, and Sir Frederick Menzies, medical officer of health for the county of London, and the Lister fellowship has been awarded to Dr. Edith K. Dawson for her work on the pathology of the breast. The medical profession in Edinburgh are exceptionally fortunate in having this excellent laboratory at their disposal.

Appointments

CRAIG, N. S., M.D. Manch., has been appointed Medical Superintendent, St. Peter's Hospital, L.C.C.

GILL, W. J., M.D. Aberd., F.R.C.S. Edin., Medical Superintendent, Paddington Hospital, L.C.C.

Vacancies

For further information refer to the advertisement columns

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

Ashford Hospital, Kent.—H.S. £150.

Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. At rate of £150.

Barnsley County Borough.—M.O.H., &c. £900.

Belfast, Royal Maternity Hospital.—Two Res. H.S.'s. At rate of £100 and £52 respectively.

Birkenhead Municipal Hospital.—Sen. Res. M.O. £350. Also Res. M.O. £300.

Birmingham Education Committee.—Asst. School M.O. £500.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Res. M.O. £300.

Birmingham and Midland Hospital for Women.—H.S. At rate of £100.

Board of Control, Rampton State Institution for Mental Defectives, nr. Retford.—Deputy Med. Supt. £847. M.O. £515.

Bolton Royal Infirmary.—Res. Surg. O., also Asst. Res. Surg. O. £250 and £200 respectively.

Bootle General Hospital.—H.S. to Spec. Dept. At rate of £150.

Bradford Royal Eye and Ear Hospital.—H.S. £160.

Bristol, City and County of.—Asst. M.O.H. £500.

British Postgraduate Medical School, Ducane-road, Shepherd's Bush, W.—Cas. O.'s. At rate of £150. Also H.P.'s and H.S.'s.

Burton-on-Trent General Infirmary.—H.S. £150.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. £120 and £100 respectively.

Coventry and Warwickshire Hospital.—Res. Surg. O. £200.

Denbigh, North Wales Sanatorium.—Asst. Tuberculosis M.O. £500.

Denbighshire County Council.—County M.O.H., &c. £1100.

Dewsbury and District General Infirmary.—Sen. H.S. £200.

Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts. £175.

Dreadnought Hospital, Greenwich, S.E.—Receiving Room Officer. Also H.P. At rate of £200 and £110 respectively.

Dumfries a [illegible] upt. £500.

East Ham [illegible] £300.

Epsom Co [illegible] At rate of £250.

French Hospital and Dispensary, 172, Shaftesbury Avenue, W.C. Jun. Res. M.O. £100.

Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W. Hon. Anæsthetist. 20 guineas.

Guildford, Warren-road Hospital.—Res. Asst. M.O. At rate of £250.

Harrogate and District General Hospital.—H.P. and Cas. O. Also H.S. Each at rate of £150.

Huddersfield, Mill Hill Isolation Hospital.—Res. M.O. £350.

Huddersfield, Storthes Hall Mental Hospital, Kirkburton.—Fifth Asst. M.O. £350.

Hull, Anlaby-road Institution.—Asst. M.O. £350.

Hull Royal Infirmary.—Third H.S. At rate of £150.

Iraq Government.—M.O. Dinars 70 a month.

Kingston and District Hospital.—Visiting Physician. £300. Also Visiting Aural S., Orthopædic S., and Neurologist.

Leamington Spa, Warneford General Hospital.—Res. H.S. to Cas., &c., Dept. At rate of £150.

Leicester City Mental Hospital, Humberstone.—Third Asst. Res. M.O. £350.

Leicester County Sanatorium and Isolation Hospital, Markfield.—Res. M.O. £400.

Leicester Royal Infirmary.—H.S.'s, Cas. O., H.P.'s, Jun. Res. Anæsthetist. Each at rate of £125. Also Jun. Cas. O. At rate of £100.

Lincoln, The Lawn.—Asst. M.O. £300.

Liverpool, Alder Hey Hospital.—Res. Asst. M.O. £200.

Liverpool, City Infectious Diseases Hospitals.—Asst. Res. M.O. £200.

Liverpool Heart Hospital.—H.P. At rate of £100.

Macclesfield General Infirmary.—Second H.S. £150.

Manchester, Booth Hall Hospital.—Two Jun. Asst. M.O.'s. Each at rate of £200.

Manchester Hospital for Consumption, &c.—Res. M.O. for Ear, Nose, and Throat Dept., St. Anne's Home, Bowdon. £200.

Manchester, Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. Each at rate of £150.

Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.—Pathologist. £650.

Middlesbrough, North Riding Infirmary.—Third H.S. £125.

Miller General Hospital, Greenwich-road, S.E.—2 Cas. O.'s. Each at rate of £150. H.P. and H.S. Each at rate of £100.

Nelson Hospital, Merton, S.W.—Two Res. H.S.'s. Each at rate of £100.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. or H.S. At rate of £100.

Northampton General Hospital.—H.S. At rate of £150.

Northumberland County.—Sen. Tuberculosis Officer. £800.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Norwich, Norfolk and Norwich Hospital.—H.S. to Surg. Outpatient Dept. £200.

Nottingham General Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.

Peterborough and District Memorial Hospital.—Pathologist. £500.

Plymouth, City General Hospital.—Asst. M.O. Also Jun. Asst. M.O. £300 and £250 respectively.

Plymouth, Prince of Wales's Hospital.—H.P. and H.S. Each at rate of £120.

Portsmouth Royal Hospital.—H.P. At rate of £130.

Preston and County of Lancaster Royal Infirmary.—Two H.S.'s. At rate of £250 and £150 respectively.

Prince of Wales's General Hospital, N.—Hon. Surg. Reg. to Ear, Nose, and Throat Dept. £100. Also Jun. H.P. and two Jun. H.S.'s. Each at rate of £90.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, Kensington, W.—H.P. At rate of £100.

Reading, County Borough, Battle Hospital.—Res. Asst. M.O. £300.

Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100.

Rotherham County Borough Education Committee.—Sen. School M.O. £750.

Rotherham Hospital.—Cas. H.S. £150.

Royal Chest Hospital, City-road, E.C.—Med. Reg. £50.

Royal Eye Hospital, St. George's-circus, Southwark, S.E.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively.

Royal Northern Hospital, Holloway, N.—H.P. Also Obstet. H.S. Each at rate of £70.

Ruthin Castle, N. Wales.—Jun. Res. Physician. £200.

St. Helens County Borough.—Asst. M.O.H. £500.

St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. £125.

St. Paul's Hospital for Diseases of the Genito-Urinary Organs, &c. Part-time Pathologist.

Sheffield Royal Infirmary.—Second Asst. Cas. O. At rate of £80.

South-Eastern Hospital for Children, Sydenham, S.E.—Two Res. M.O.'s. Each at rate of £100. Also Hon. Pathologist. £50.

South London Hospital for Women, Clapham Common, S.W.—H.P. At rate of £100.

Tilbury Hospital, Essex.—H.S. At rate of £140.

Tunbridge Wells, Kent and Sussex Hospital.—H.S. to Ear, Nose, and Throat and Ophthalmic Depts. £150.

University of London.—Graham Scholarship in Pathology. £300.

Ventnor, Isle of Wight, Royal National Hospital for Consumption, &c.—Jun. Asst. Res. M.O. At rate of £300.

Weir Hospital, Grove-road, Balham, S.W.—Sen. Res. M.O. £200. Jun. Res. M.O. £150.

West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.

Wimbledon Hospital, Thurstan-road, S.W.—Res. M.O. At rate of £150.

Wolverhampton, Royal Hospital.—H.S. for Fracture and Orthopædic Dept. At rate of £100.

Woolwich and District War Memorial Hospital, Shooter's-hill, S.E.—Res. M.O. £175.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Wigston, Leicestershire.

Births, Marriages, and Deaths

BIRTHS

BOLT.—On July 29th, at Great Russell-street, W.C., the wife of R. F. Bolt, M.R.C.S. Eng., of a son.

DAWES.—On August 11th, at Welbeck-street, W., the wife of W. A. Dawes, M.R.C.S. Eng., of a son.

FARNCOMBE.—On July 31st, at Euston-road, the wife of Ronald Farncombe, M.R.C.S. Eng., of a daughter.

GABRIEL.—On August 4th, at Highgate, the wife of W. B. Gabriel, F.R.C.S. Eng., of a son.

THOMAS.—On August 6th, the wife of Clement Price Thomas, F.R.C.S. Eng., of a son.

MARRIAGES

MACCALMAN—DAWSON.—On August 5th, at the Parish Church, Colonsay, Argyll, Douglas R. MacCalman, M.D. Glasg., to Helen Grego Dawson, M.A., elder daughter of Mr. John M. Dawson, M.A., LL.D., of Perth.

SWINBURNE—FENTON.—On August 6th, at Hawkhurst, Spearman Charles Swinburne, M.R.C.S. Eng., to Millicent, widow of G. R. Fenton, the Connaught Rangers, and elder daughter of the late Lieut.-Col. E. H. Montrésor, Royal Sussex Regt.

DEATHS

HAYNES.—On August 6th, at Leamington Spa, Frederic Harry Haynes, M.D., F.R.C.P. Lond., aged 90 years.

MACLEOD.—On August 8th, suddenly, at Edinburgh, William Bernera Macleod, M.B. Edin., Surgeon Captain, R.N. (retd.), aged 67 years.

PORTER.—On August 9th, at Wakefield, Surgeon Vice-Admiral Sir James Porter, K.C.B., K.C.M.G., M.B. Aberd., late Medical Director-General, Royal Navy, aged 83 years.

SPICER.—On August 8th, at Wimbledon Common, William Thomas Holmes Spicer, F.R.C.S. Eng., aged nearly 75.

WILSON.—On August 9th, at a nursing-home, Foden Wilson, M.R.C.S. Eng., of North Birkenhead, in his 72nd year.

WRIGHT.—At his residence, Boulderwood, Woking, after a brief illness, Alfred Wright, C.B.E., L.R.C.P. Edin., M.R.C.S. Eng., late Brevet Lt.-Colonel, R.A.M.C.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

BENJAMIN BRODIE *

BY H. E. MANSELL, B.M. Oxon., M.R.C.P. Lond.
LATE RESIDENT ASSISTANT PHYSICIAN, ST. GEORGE'S HOSPITAL

THE brightness of Hunter's star has tended rather to blind observers to other stars in the surgical firmament, but Benjamin Brodie's biographer and distant successor held Brodie to have brought the most acute intellect and the most powerful mind to the study of surgery, after John Hunter.

Brodie was born in 1783, the fourth of six children; his father, the Member of a Banffshire clan and a good classical scholar, held the living of Winterslow, near Salisbury. He sent none of his sons to school or to a university, but kept them well to their work at home. Of his home life Brodie writes in his autobiography:

> In the summer my brothers and myself rose at 6 o'clock and two hours were devoted to study (generally learning to repeat Greek and Latin poetry or Cicero's orations) before we breakfasted at 8 o'clock. Immediately after breakfast we resumed our studies. We dined at 3 o'clock and were then at our studies again from 4 to 6 o'clock. . . . On two days in the week, when my father was absent on public business, we had half-holidays. We had no other vacations during the whole year except on some grand occasions, such as a cricket match or the first few days of the skating season. . . . The result has been that the habit of being employed in some kind of study became a part and parcel of my nature. . . . Much of my success in my worldly career is, I am convinced, to be attributed to this discipline in my early years.

YOUNG DETERMINATION

The father impressed on his children that they would have to obtain their livelihood by their own exertions. For Benjamin the medical profession was chosen, and it is interesting to note that he disowned any particular liking for that profession and any faith in the special call to certain ways of life which some young men are supposed to have. He wrote that the persons who succeed best in professions are those who, having (perhaps from some accidental circumstance) been led to embark in them, persevere in their course as a matter of duty or because they have nothing better to do.

In a letter written in after-life to his elder son, then sixteen, he mentioned that his own four years between the ages of 16 and 20 were among the most valuable of his whole life.

> It was in that interval of time, he wrote, that I acquired habits of perseverance and industry, and that I learned to direct my attention to a particular object instead of travelling from one subject to another. I think too that I can recollect my having then, for the first time, meditated upon my own character and become sensible of some of my own faults, a branch of knowledge of more consequence than all the Greek and mathematics that schools and colleges can teach to the most zealous student. It is said to be desirable that you should know the world; but it is much more so that you should know yourself. Always keep before your mind the maxim which was inscribed over the Temple of Delphi: γνῶθι σεαυτόν.

After previously studying anatomy in the Hunter School in Great Windmill-street, he entered as a pupil of St. George's Hospital in 1803, and found that for himself at first, as for other students, all was confusion; the niceties of diagnosis, prognosis, and treatment were incomprehensible. The mist soon cleared, when every case became an interesting subject of inquiry. In his own vivid words "a great game was being played in which the stake was often neither more or less than the life or death of a fellow-creature, and in which those among the students who devoted themselves to their business performed a humble yet not unimportant part without any painful feeling of responsibility." Brodie gained some knowledge of materia medica, for by Dr. Baillie's advice, when he had no subject for dissection, he attended a chemist's shop at the corner of Little Newport-street. The proprietor of it, one Mr. Clifton, also practised as an apothecary, exercising his art among the tradesmen of the neighbourhood. His treatment of disease was simple. He had in his shop five large bottles—"Mistura Salina," "Mistura Cathartica," "Mistura Astringens," "Mistura Cinchonæ," and some kind of white emulsion for coughs, and out of these he prescribed for two-thirds of his patients. Brodie did not set this down to his discredit, for

> I have observed (he wrote) that while young members of the medical profession generally deal with a great variety of remedies, they generally discard the greater number of them as they grow older, till at last their treatment of disease becomes almost as simple as that of the Æsculapius of Little Newport-street. There are some indeed that form an exception to this general rule, who, even to the last, seem to think they have, or ought to have, a specific for everything, and are always making experiments with new remedies. The consequence is that they do not cure the patients, which the patients at last find out, and then they have no patients.

GOOD FRIENDS AND PROGRESS RAPID

In May, 1805, Brodie became house surgeon at the hospital, but, like Hunter, resigned the post after a few months in order to teach anatomy at the Windmill-street school. He also at this time accepted a proposal from Everard Home to act as assistant in his private practice and work for him at the museum of the Royal College of Surgeons of England. This latter employment proved to be of critical importance to him, not only because it kept his scientific outlook wide at a time when he might have been tempted to devote himself exclusively to practical surgery, but also because it led to an introduction to the great Sir Joseph Banks, who was president of the Royal Society from 1778 to 1820. At Banks's house he associated with Herschel, Davy, Woollaston, Young, Home, Abernethy, Carlisle, and others who formed the brilliant intellectual society of the day.

In 1808 Brodie was appointed "assistant surgeon to Everard Home"—not to the hospital, for the latter post was begotten later of the out-patient system, which, says Timothy Holmes, "lay like an incubus on all London hospitals." He became full surgeon in 1822, and held office till his resignation in 1840 for reasons which are well worth quoting:

> One of them was that I began to feel the necessity of diminishing the amount of my labours. Then I had long since formed a resolution that I would not have it said of myself, as I had heard it said of others, that I had retained a situation of such importance and responsibility when, either from age or indifference, I had ceased to be fully equal to the duties belonging to it; and lastly, when I saw intelligent and diligent and otherwise deserving young men waiting their turn to succeed to the hospital appointments, it seemed to me that there was something selfish in standing longer in their way, when as far as my own worldly interests were concerned I had obtained all that I could desire.

He was elected president of the Royal Medical and Chirurgical Society in 1839, of the Royal College of Surgeons of England in 1844, and of the Royal Society in 1858. He was the first president of the General Medical Council (1858–1860); president of the Ethnological Society in 1853, and president of the Section of Social Economy in the National Association for the Promotion of Social Service in 1857. He attended George IV., and in 1828 he was made surgeon-in-ordinary to the King. He was subsequently serjeant-surgeon to William IV. and

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* Extracted from "Round the Board-room at St. George's," a paper read to the Osler Club on Feb. 22nd, 1935.

Queen Victoria, and in 1834 was made a baronet. His "Collected Works," which were edited by Charles Hawkins and published in 1865, contain his autobiography, numerous original contributions to surgical literature, including his masterly treatise "On Diseases of the Joints," and many introductory discourses and presidential addresses, which revealed the width and depth of his knowledge and interests. He died on Trafalgar Day, 1862, in his eightieth year.

PIONEER IN EDUCATION

Brodie revolutionised the teaching of surgery by his example at St. George's Hospital. Until his time the surgeons used only to go round the wards on two days in the week and never attended otherwise, except when there were operations to perform or when they were especially sent for on emergency. Brodie and Robert Keate, who was surgeon to the hospital from 1800 to 1853, were the first persons to be at their post daily, and there was never an urgent case that they did not visit in the evening and not infrequently early in the morning also. No wonder that the effect of so healthy a change was soon visible in the increase of zeal and diligence on the part of the students and in their increasing numbers. It was, in effect, the commencement of Brodie's reputation as a surgeon and teacher of surgery, and of the rise of the St. George's School to the high position which it held during the whole period of Brodie's services there. He also appointed clinical clerks and began to give clinical lectures, the first ever delivered in a London hospital. He always endeavoured to impress on the minds of his pupils the necessity of making and preserving written records of their experiences. To-day, when we hear so constantly of so much that is wrong with our medical curriculum, it is of interest to remember how bitterly Brodie complained that the great mass of students were so occupied by the large (and in his opinion unnecessary) number of lectures which they were required to attend, and in running from one classroom to another, that they really had neither the leisure nor the physical powers necessary for pursuing in any efficient manner the practical study of disease in the wards of the hospital. He considered it a great mistake to compare the examination of young men entering a profession with those for degrees in a university.

"The Senior Wrangler," he wrote, "might be a great mathematician and the first-class man in classics might be a first-rate Greek scholar, but the utmost that could be expected of a young lawyer or physician or surgeon was that he should show that he had laid such a foundation as might enable him to profit by the opportunities of experience presented to him afterwards. To be a thorough master of his profession in the beginning of his career was out of the question and was a thing to be attained only by unremitting study and close observation continued during a long series of years." These views were not applicable to the Fellowship of the College, which Brodie instituted "with the object of ensuring the introduction into the profession of a certain number of young men who might be qualified to maintain its scientific character, and would be fully equal to its higher duties as hospital surgeons, teachers, and improvers of physiological, pathological, and surgical science afterwards."

After Brodie's death a pupil wrote that Brodie was always distinguished for the value of the matter he had to communicate; those who heard him in the early part of his career found him then energetic rather than polished—struggling with the weight and mass of facts stored up in his mind—but in later years his delivery was fluent and perfect. And Sir Henry Acland, also a St. George's man, has said of Brodie, as a lecturer, that none who heard him could forget the graphic yet artless manner in which, sitting at his ease, he used to describe minutely what he had himself seen and done under circumstances of difficulty, and what under like circumstances he would do again or avoid. His instructions were illustrated by valuable pathological dissections which during many years he had amassed, and which he gave, during his lifetime, to his hospital. He considered it to be one of the most valuable and useful collections of the kind in the metropolis, and a similar view was expressed by Osler of the post-mortem records of the hospital, which have been continuous since 1841.

GREAT PUBLIC POSITION

Brodie held a unique position among his contemporaries, and his services were in wide demand. He was consulted by Brunel, the engineer of the Great Western Railway, when that gentleman had shown his inexperience as a conjuror by inhaling a half-sovereign. He attended Sir Robert Peel after his fall while riding up Constitution Hill, and has left a detailed account of the case. He was called as a medical witness in the celebrated trial of William Palmer, and later in the Smethurst case. Here his evidence was short, clear, and decisive, and a *Times* reporter added: "Sir Benjamin Brodie gave his evidence with great clearness—slowly, audibly, and distinctly—matters in which other medical men would do well to emulate such a distinguished example." Holmes, his biographer, comments:

> If all medical witnesses would follow Brodie's example, professional testimony would rise in public and in forensic estimation; we should cease to look on the degrading spectacle of witnesses who seem to be as much retained for one side or the other as the advocates are. They would speak of matters of fact, resting on the sure ground of their own and others' experience, avoiding dubious hypotheses, and the wranglings of pretended "science"; and, speaking in plain English, without bombast or technicality, they would guide and assist the court in forming a just judgment, instead of misleading and confusing it.

Brodie's works repay perusal to-day for their variety of interest and for their qualities of clearness, common sense, and humour. A careful observer of life and all its functions, he studied death with equal care and minuteness, and it is consoling to read that "he had never known but two instances in which, in the act of dying, there were manifest indications of the fear of death." You will remember how Osler recorded from a study of about 500 deathbeds, that the majority of the dying "gave no sign one way or the other; like their birth, their death was 'a hope and a forgetting.'"

Let me end this study of Brodie with another quotation from his autobiography:

> During these thirty-two years of office, the hospital, as far as my profession was concerned, was the greatest object of interest I possessed. Except during the brief intervals of my absence from London, it rarely happened that I was not at some time during the day within its walls. I was indebted to the opportunities which it afforded me for the best part which I had been able to attain. It had rendered my professional life one of agreeable study instead of one of mechanical and irksome drudgery. Some of my happiest hours were those during which I was occupied in the wards with my pupils around me, answering their inquiries, explaining the cases to them at the bedside of the patients, informing them as to the grounds on which I formed my diagnosis and my reasons for the treatment I employed, and not concealing from them my oversights and errors; and all this to kind and willing and only too partial listeners. My intercourse with the students, and I may add, with the patients also, was always to me a source of real gratification; and even now (many years afterwards) these scenes are often renewed to me at night, and events of which I have no recollection when awake come before me in my dreams.

THE RIGHT TO CURE

THE Institute of Identification at Rio de Janeiro publishes official archives containing contributions which are sometimes of more than merely forensic interest. For example, C. Brisard and M. Ducosté[1] both discuss the "right to cure"—more precisely the right of a surgeon to operate—without the consent or even against the will of the patient. The risk run by the surgeon who, in these circumstances decides to operate, of finding himself subsequently the victim of legal proceedings is minimised by neither author. This risk is naturally greatest if the patient dies, but even if recovery follows the patient or his friends may bring an action against the surgeon, especially if some residual disability remains. An instance of the latter would be a ventral hernia resulting from an abdominal section. Brisard quotes a case calculated to discourage well-meant interference. A man hanged himself; was found and cut down by a passer-by; in falling to the ground fractured his thigh; and successfully sued his rescuer for damages! In spite of this example, Brisard concludes that a surgeon must not shrink from exercising his own judgment should the occasion arise; consoling himself with the thought that unless negligence or faulty technique can be proved against him, he has good grounds for hoping that the court will take a lenient view of his case.

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[1] Arquivos de Med. legal e Identificaçao, 1934, iv., 9.

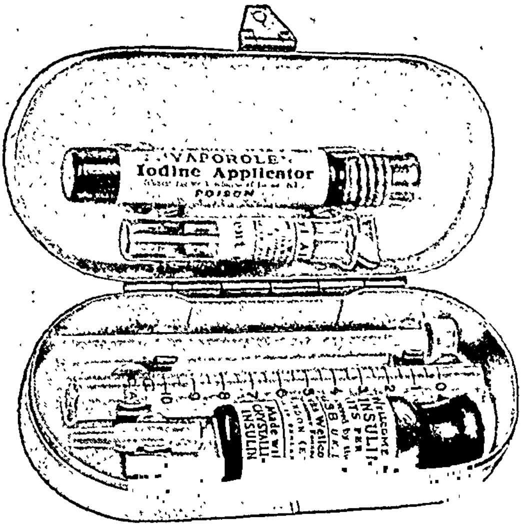
CANCER RESEARCH IN YORKSHIRE

THE annual report of the Yorkshire council of the British Empire Cancer Campaign relates work carried on at two research centres. Prof. R. D. Passey (Leeds) has continued his attempts to induce gastric cancer in rats by infecting them with the *Gongylonema neoplasticum* in the manner first described by Fibiger. Although the animals were successfully infected with a parasitic worm, and although its presence could be demonstrated in the œsophagus and stomach, in no case did cancer develop. This failure is remarkable as hitherto Fibiger's results have been accepted as generally valid.—Dr. Berenblum has continued his investigations on certain skin irritants, such as mustard gas, which have the power to inhibit experimental carcinogenesis by tar. He finds that, while all the compounds which inhibit carcinogenesis are skin irritants, not all skin irritants inhibit the carcinogenesis. With Drs. Orr and Kendal he has studied the action of mustard gas on cellular metabolism. It was found that anti-carcinogenic substances have the power of inhibiting glycolysis rather than respiration of tumour tissue. The substances related to mustard gas which do not inhibit carcinogenesis produce no effect on either respiration or glycolysis, or depress both equally.—Dr. K. J. Bonser, working with special strains of mice, has been able (following Lacassagne) to induce mammary cancer in male mice by repeated injection of œstrin. The positive results were obtained in male mice from a strain having a high incidence of spontaneous mammary cancer in the females. Differences in susceptibility to œstrin do not appear to be related to differences in the normal œstrous cycle.

Prof. E. Mellanby (Sheffield) has confirmed the observation that in a fowl bearing a Rous tumour the filtrable agent is distributed widely throughout the tissue and body fluids. Experiments were carried out in which the experimental induction of cancer in mice by dibenzanthracene was compared with that in mice similarly treated but receiving at the same time injections of the Rous agent from fowls. The results show that the introduction into mice of the Rous agent from the fowl did not significantly modify the development of cancer in mice. Experiments bearing on the chemotherapy of cancer were carried out with the idea of finding substances which would interfere with the respiration of cancer cells. Two such substances were investigated, namely, dilute potassium permanganate and various snake venoms.—Prof. H. W. Florey also submits a short report on various new lines of investigation.

AN INSULIN POCKET-CASE

THE "Wellcome" brand insulin pocket-case (No. 46), made of nickel-plated metal, is specially designed by its measurements to fit comfortably into the pocket. It contains the materials and apparatus necessary for the administration of insulin. The contents are as follows: (1) "Agla" insulin syringe (1 c.cm. graduated in 1/20ths). (2) "Agla" surgical needle (rustless steel), in glass-stoppered container. The container is intended for ethyl alcohol, in which the needle will be immersed, thus maintaining it in an aseptic condition. (3) 5 c.cm. rubber-capped phial of "Wellcome" brand insulin, containing 100 units. (4) "Vaporole" iodine applicator for use when sterilising the skin at the site of injection and the rubber cap on the insulin phial prior to removal of a dose.



The outfit should be specially useful when injections are to be self-administered.

NEW PREPARATIONS

THEOTONE.—This preparation is manufactured in tablet form by Messrs. Allen and Hanburys Ltd., London, the formula being theobromine grs. 5, phenobarbitone gr. ¼. The diuretic action of theobromine has been investigated and established for some years. While it is also a dilator of the coronary arteries, it resembles caffeine in its effects, but its use is apparently not contra-indicated when the blood pressure is high. Its trial in cases of angina pectoris or intermittent claudication before trying sympathectomy has been advocated by certain medical observers. The combination of theobromine with phenobarbitone has been found beneficial in cases of high blood pressure and conditions which may be summarised as those of cardiovascular over-activity.

SALEPSI RUSSI.—This preparation, which can be obtained in solution and in pill form, is designed as a sedative, and claims to have special indications in epilepsy. It is manufactured at the chemical and pharmaceutical works of Russi and Co., Antona, Italy, Messrs. Coates and Cooper Ltd., London, being the English agents. The formula is: 25 drops (1 c.cm.) contain ethyl-phenyl-barbituric acid, 0·05 g.; cascara sag., 0·10 g.; antispasmodic extracts, scopola, stramonium; valerian, 0·04 g.; saccharin, 0·002 g. Messrs. Coates and Cooper inform our readers that specimens will be forwarded upon request.

THE DEATH OF JINNY.—To our issue of July 27th Dr. Kathleen Vaughan communicated a note upon a pet chimpanzee named Jinny, for whom a home was needed. Dr. Vaughan's note brought numerous communications to Jinny's owner, Mrs. Basham, but sad to relate Jinny died on the Monday following the publication of her story. We learn that many offers to receive her as an inmate were received from readers of THE LANCET, and the news of her death is announced here as an explanation why Mrs. Basham has not replied to all the letters.

ADDRESSES AND ORIGINAL ARTICLES

RHEUMATISM AND ITS RESULTS*

By K. DOUGLAS WILKINSON, O.B.E., M.D.Birm., F.R.C.P. Lond.

PROFESSOR OF THERAPEUTICS IN THE UNIVERSITY OF BIRMINGHAM

POLYARTHRITIS is as old as history, indeed it is found in prehistoric man, and was described by Hippocrates with graphic accuracy. Yet the history of rheumatism as we know it is relatively short. Gwilliam de Baillou, a French physician who died in 1616—the year of Shakespeare's death and Harvey's initial lectures to the Royal College of Physicians—was the first to use the word "rheumatism," to apply it to a form of acute arthritis which he distinguished from gout, and to make rheumatism a clinical entity; and it was 60 years later that Sydenham, "the father of English Medicine," first gave us a detailed description of acute rheumatism.

Sydenham knew a lot about gout; he had learned in the hard school of personal experience, for he suffered from it and is said to have died of it. Of rheumatism he said:—

> "The disease comes on at any time, but especially in the autumn, and chiefly seizes those that are in the flower of their age . . . it begins with shivering and shaking and presently heat, restlessness and thirst, and other symptoms which accompany a fever. After a day or two, and sometimes sooner, the patient is troubled with a violent pain sometimes in this, sometimes in that joint, in the wrists and shoulders, but most commonly in the knees. It now and then changes places and seizes elsewhere, leaving some redness and swelling in the part last possessed."

He described chorea too, but does not appear to have associated the two conditions. The picture of chorea is very good:—

> "This disease is a kind of convulsion which seizes children of both sexes from the tenth to the fourteenth year. It manifests itself by a halting or unsteadiness of one of the legs, which the patient draws after him like an idiot. If the hand of the same side be applied to the breast, or any other part of the body, the child cannot keep it a moment in the same posture, but it will be drawn into a different one by a kind of convulsion, notwithstanding all his efforts to the contrary. Before a child who hath this disorder can get a glass or a cup to his mouth he useth abundance of odd gestures, for he does not bring it in a straight line thereto, but his hand being drawn sideways by the spasm, he moves it backwards and forwards till, at length the glass accidentally coming nearer his lips, he throws the liquor hastily into his mouth, and swallows it greedily as if he meant to divert the spectators."

Rheumatic pleurisy was described in exact detail in 1762 by Storck, a Viennese physician, and about 1776 cardiac involvement in rheumatism was first recognised by a Dutchman Van Swieten who practised in Vienna. He said: "Sometimes when the pain of rheumatism in the limbs ceases there arises an anxiety of the breast, a palpitation of the heart and an intermitting pulse." It was in this year that the General Hospital began in Birmingham, and William Cullen, the professor of medicine in Edinburgh, a great pharmacologist and one of Withering's teachers, pointed out that rheumatic joints never suppurated. Some ten years later J. C. Lettsom, the famous Quaker physician, read a paper on cases of palpitation and quoted the case of a boy aged 6 years who had had rheumatic fever followed by cough, respiratory distress, and palpitation, from which he died within three months. A post-mortem examination showed cardiac enlargement and a right lung pneumonia. Matthew Baillie stated that about the year 1788 David Pitcairn in his lectures at St. Bartholomew's Hospital taught that acute rheumatism and heart disease were but different manifestations of a single disease. And about the same date Edward Jenner favoured the Gloucester Medical Society at a meeting held at the Fleece Inn at Rodborough with remarks on a case of disease of the heart following acute rheumatism, illustrated by dissections.

RECOGNITION AS A CAUSE OF HEART DISEASE

In the early years of the nineteenth century the combination of rheumatism and heart disease received a good deal of attention. Louis Odier, a Frenchman educated in England, wrote on this association, while David Dundas collected a number of cases and published them in 1806 in the *London Medical Journal*. W. C. Wells wrote a review of rheumatic disease of the heart in 1810; his name deserves to go down in history for he was the first to describe rheumatic nodules and to note the presence of albumin in the urine in nephritis. But there was no general recognition that rheumatism was commonly associated with heart disease, for John Haygarth, who wrote a "Clinical History of Acute Rheumatism" in 1805, a work based on 170 cases of acute rheumatism, made no mention of involvement of the heart. And as late as 1832 Hope, in a classic treatise on diseases of the heart and great vessels, only mentioned acute rheumatism as a cause of pericarditis in children and young persons. It was not till Balfour's observations in 1816 that we find the first indications of a rational conception of the real pathology of acute rheumatism as a disease, for whereas Sydenham, Haygarth, and Cullen had each regarded rheumatism as essentially a disease of articular structures, Balfour took a far wider view. According to him the seat of the disease was in the cellular membrane, and he thought that all structures composed of this membrane were attacked by the rheumatic process. The significance of his ideas are shown by the following statement. "The cellular membrane abounds everywhere in the body . . . all the blood-vessels receive a coat from it, from the aorta where it emerges from the heart to the minutest capillary that enters a tendon." Similar ideas were held by Charles Scudamore. His "Treatise on Nature and Cure of Gout and Rheumatism" (1819) constitutes the disease as "a peculiar species of inflammation, affecting parts which have a fibrous texture, and most frequently synovial membrane. . . ." He realised, as did Balfour, the remarkable predilection of rheumatism for the synovial membranes of the body and gave as examples of this fact instances of inflammation of the dura mater and of the pericardium. "The pericardium," he stated, "also sometimes becomes the seat of similar morbid action which I conceive as secondary and induced by the inflammation which is affecting some part of the tendinous structures of the heart." The study of heart disease received a tremendous impetus from the invention of the stethoscope by Laennec in 1819. Before this investigation of the heart was most inadequate, its pulsations were seen and felt and the pulse was considered, but the lack of accurate instruments of precision such as watches with second hands made accurate counting difficult if not impossible. The stethoscope directed attention to heart sounds, and immediately after its invention numerous French physicians made important contributions to our knowledge of heart disease. But the instrument took a remarkably long time to come into general use.

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* The Ingleby lectures for 1935 delivered at the University of Birmingham on June 13th and 20th, 1935.

As a post-mortem finding endocarditis had been noted as early as 1709 by Lancisi, and described in some detail by Morgagni in 1761, but Bouillard in 1836 was the first to point out the clinical signs of rheumatic endocarditis, and he went so far as to state emphatically that endocarditis was not merely a complication of rheumatism, but was one of its cardinal manifestations. Another Frenchman, Lasègue, made a graphic statement well worthy of preservation: "Le rheumatisme aigu lèche les jointures, la plèvre, les méninges même, mais il mord le coeur." ("Rheumatism is a disease which licks the joints, the pleura and the meninges, but it bites the heart.") Babbington, writing in 1821, said that Addison of Guy's was the first teacher to associate chorea and rheumatism, but it was 20 years later that Begbie noted the familial incidence of rheumatism and chorea. In 1843 Sir Thomas Watson pointed out that children as early as 3 or 4 years might develop carditis, and stated that, the earlier they had acute rheumatism the more certainly were their hearts involved. Sir Thomas was the first to stress the supreme importance of rest in the treatment of carditis, and quoted Dr. Warren, who when asked what was good for rheumatism had replied "six weeks." It is said that to Sir Thomas Watson we owe the term "water hammer" applied to the characteristic pulse of aortic disease; it is certain that Corrigan never used it. In 1845 Latham showed how important the stethoscope had become, for he said to his students: "Listen every day to the cases of rheumatic fever, for the endocardial lining may be involved even in the mildest cases." Thereafter an ever-growing host of observers wrote on the subject of rheumatism. Great names appear: Hillier described rheumatic pneumonia; Leherts redescribed the rheumatic nodule; Meynet, Hirschsprung, Warner, and others wrote and described well; and yet the fact that acute rheumatism involved the heart muscle was not recognised before 1876. Degenerative changes were described, but no active inflammatory process until Romberg in 1894 found rheumatic nodules in the heart muscle and regarded them as interstitial myocarditis. The clinical work of Sturges, Barlow, Cheadle, Lees, and Poynton (physicians of the Great Ormond-street School) proved that the muscular tissues of the heart were involved, and in 1904 Aschoff depicted in detail the microscopic appearance of the characteristic lesion of the rheumatic process as we know it to-day.

So we see that whereas early in the nineteenth century acute rheumatism was considered merely a disease of joints, with the occasional involvement of heart, brain, or lungs by a kind of metastatic spread, and that in the occasional cardiac involvement pericarditis was common, endocarditis rare, and myocarditis undreamed of, by the end of the century a very marked change in medical knowledge had caused acute rheumatism to be regarded as a protean disease commonly associated with serious results in as much as a characteristic type of inflammation involved blood-vessels throughout the body, but especially in the heart and synovial membranes. Moreover, it was recognised that rheumatism was essentially a disease of childhood, and that while the involvement of joints and subcutaneous tissues was of small importance, in every case some cardiac damage occurred.

Ætiology

The history of the various theories put forward to explain rheumatism is important and interesting, for no disease has provided a greater diversity of opinion, nor produced problems of greater interest and complexity. The very name rheumatism suggests a condition arising from within, for the rheum was a cold damp humor which flowed down from the brain. All observers have agreed that rheumatism is associated with cold and damp—Cullen taught that cold and damp caused constriction of blood-vessels and so produced local inflammation and fever. Dr. William Prout, who lived from 1785 to 1850, wrote extensively on the chemistry of the body and was responsible for the lactic acid theory. He pointed out that the sweat, saliva, and urine were apt to be very acid in cases of rheumatism, and suggested that an accumulation of lactic acid in the blood was the essential cause of the condition. This theory evoked the alkaline treatment, and was supposed to be proved both by the improvement which followed the use of alkalis, and by certain experimental findings, Sir Benjamin Ward Richardson producing endocarditis by injecting lactic acid into dogs and other animals. For a while lactic acid was used as a treatment for diabetes, and in 1874 Dr. Balthazer Foster (a Birmingham physician) afterwards Lord Ilkeston, reported a case in which six well-marked attacks of multiple arthritis followed treatment with large doses of lactic acid.

As early as 1831 Dr. J. R. Mitchell suggested that acute rheumatism might be a trophic disorder—a disease of the nervous system with changes in the nutrition of the joints—and even before this Haygarth had believed that acute rheumatism could be produced by excessive fatigue from dancing or other forms of violent exercise, and imagined that some part of the brain controlling joints must lie near that part which controlled sweating. Latham taught that cold caused anæmia of the skin and hyperæmia of muscles. This resulted in an abnormal body chemistry and produced an excess of uric acid which caused the joint inflammation. Sir Alfred Garrod disproved this by showing that there was no excess of uric acid in the blood.

T. J. Maclagan who discovered salicin was a theoris of the most courageous type. He believed that th materies morbi of acute rheumatism was not generate in the body, but obtained entrance from without that the disease could not be one of the commo contagious disorders, since it was not infectious conferred no protection against a second attack, an had an indefinite duration. He therefore though that acute rheumatism was allied to malaria— miasmatic disease, liable to appear in low lying damp localities at certain seasons. And since beneficent providence had provided a cure for malar in the bark of a tree indigenous where malaria wa endemic—the remedy for rheumatism was to sought in the bark of a tree which grew in dam low lying sites. He hunted, and he found salic in the bark of the willow, and published his discove in 1876. Within three years of this discovery salici salicylic acid, or sodium salicylate were in gene use wherever acute rheumatism was prevalent, a the old clinicians proclaimed the marvellous amelio tion of the disease produced by these preparations.

BACTERIOLOGICAL AND EPIDEMIOLOGICAL OBSERVATIONS

Ten years later, 1886, Mantle reported the growth of a diplococcus from the blood and joint fluid of a child with acute rheumatism, and since this a number of observers have claimed the discovery of various organismal causes of acute rheumatism. In 1891 Achalme attracted considerable attention by reporting the discovery of a large anthrax-like bacillus from cases of rheumatism, thereby stimulating a good deal of bacteriological research. It is obvious that before this date an organismal cause had been suspected, for Trousseau, Kingston Fowler, Cheadle, Lubarsch, and Buss had all pointed out the importance of the angina faucium—the initial sore-throat—as the portal of entry of an invading organism.

In the Milroy lectures of 1895 Sir Arthur Newsholme published a most important investigation of acute rheumatism from a statistical aspect. He dealt with acute rheumatism only, although he found it confused with gout, acute and chronic polyarthritis of various forms, and many painful affections of the sheaths of muscles and nerves. His figures demonstrated that acute rheumatism was an epidemic disease of temperate climates, most prevalent in the first quarter of the year and especially in January, that predisposed persons became liable to attacks either because of an inherited predisposition, or a particular state of health, especially fatigue, chill, or injury, in certain localities and seasons, for acute rheumatism is an urban disease. He showed that there were epidemic years, and that when the disease was most common the case-mortality was lowest. Taking the Scandinavian countries because of the general excellence of their health returns, Newsholme's figures from the year 1862 to 1892, contrasting towns and countries, showed that:—

In 1888	there	were	1866	cases of acute rheumatism in	Norway	per million inhabitants.
,, 1863	,,	,,	579		,,	
,, 1885	,,	,,	2590		Oslo	
,, 1886	,,	,,	1390		,,	
,, 1883	,,	,,	2600		Denmark	
,, 1892	,,	,,	1600		,,	
,, 1871	,,	,,	5280		Copenhagen	
,, 1892	,,	,,	2720		,,	

Turning to the British Isles he found that 8·4 per cent. of all medical cases admitted to hospitals between 1865 and 1893 were cases of acute rheumatism, and mentions specially that at the Queen's Hospital, Birmingham, the figure was 9·7 per cent. of all medical admissions. He showed that while acute rheumatism occurs all over England, Lancashire has the highest, and Berkshire the lowest death-rate, and he concluded by stating that acute rheumatism was a specific disease due to an infecting micro-organism; that the disease followed an initial sore-throat, tended to relapse and predisposed to subsequent attacks. That the infectivity of any case was very low, probably because the organismal cause was concentrated about the joints, and that the infecting agent was probably a saprophyte which could become a parasite. This was a remarkable summary.

In 1899 Westphal, Wassermann, and Malkoff published a paper of considerable importance. They obtained a diplococcus from a child with acute rheumatism and chorea, and produced arthritis in numerous rabbits by injecting cultures of the organism. They recovered the organism from the inflamed joints of the rabbits, and produced similar arthritis by reintroducing it into other rabbits. Before this paper appeared Dr. F. J. Poynton and Dr. A. Payne had begun to investigate cases of acute rheumatism by bacteriological methods in order to assess the value of Achalme's claims; and in the course of their work they obtained a diplococcus from eight successive cases of rheumatic fever. The organism was a diplococcus, which on culture became a short-chain streptococcus. It was grown from synovial fluid, pericardial fluid, scrapings taken from the mitral valve at autopsy, and the blood, the cultures being obtained by incubating acid milk either aerobically or anaerobically. The organisms were injected into rabbits and produced attacks of polyarthritis, pericarditis, endocarditis of the mitral valve, pneumonia, and even appendicitis. They were demonstrated in rheumatic tissues, in the heart valves, in the subcutaneous rheumatic nodule, and also in the tonsils. Morphologically, the organism found was the same as that described by Wassermann and his collaborators and seems to-day to stand as the most probable cause of the disease. The utmost that can be said against this work is that many subsequent investigators have failed to repeat Poynton and Payne's bacteriological findings. A large number of strains of streptococci, some hæmolytic, some non-hæmolytic, have been found in the sore-throat which precedes the recrudescence of acute rheumatism, and various types have been grown from the blood of rheumatic patients.

Besides the idea that acute rheumatism might be the result of a bacterial infection of the blood and tissues either by a specific organism, or by one of a group of related organisms, or even by any member of a very wide and not necessarily related variety of bacteria, it has been suggested that the condition may result from a toxæmia—the presence of toxins, but not bacteria in the blood stream, such toxins being the products of any of several types of streptococci. Further, as an extension of this idea, it has been mooted that neither bacteria nor bacterial toxins are the responsible agents, but that rheumatism is the result of a peculiar tissue reaction—a special hypersensitivity to the products of bacterial activity. I think that Gustav Singer was the first to suggest this possibility. These theoretical suggestions have resulted in a tremendous amount of highly technical work, chiefly in American laboratories, much of which is inconclusive. About 1926 Birkhaug made a filtrate of the toxin of a non-hæmolytic streptococcus obtained from a rheumatic patient. He discovered that he himself showed a skin reaction to an intradermal injection of this organism, so he injected 1 c.cm. of the sterile toxin filtrate into himself and developed an attack of fever and polyarthritis which was relieved by salicylates. Swift and others have since repeated this observation and have shown that rheumatic patients are generally hypersensitive to intradermal injections of toxin filtrates of streptococci. But although rheumatic subjects generally give positive skin tests to streptococcal endotoxin, about 20 per cent. of normal controls do so too, and a positive reaction can be produced by streptococcal infection or injections of toxin without the production of rheumatism. Agglutinins are present in the blood of rheumatic subjects, and will clump various strains of streptococci. The sera of patients with acute rheumatism, or chronic atrophic arthritis, are particularly strong in agglutinins, but seldom possess as high an agglutinin titre as the blood of scarlet fever patients. Moreover there appears to be no relationship between the titre of the agglutinin and the skin sensitivity. It has even been found possible to determine the quantity of antihæmolysins in blood-serum, substances which inactivate the hæmolysin produced by hæmolytic streptococci of several strains. Patients in the active phase of a rheumatic attack have a high antihæmolysin titre, while those who are non-rheumatic or in a quiescent phase of the disease have a low titre. But the titre of the serum does not vary with the severity of the attack of acute rheumatism, a finding which suggests that there has been an infection with hæmolytic streptococci, which are not the causal organisms of the acute rheumatism, and that allergy is not a factor in the production of rheumatic symptoms. Schlesinger, Signy, and other observers have shown that streptococcal precipitins can be demonstrated in the blood of rheumatic children after the appearance of the pre-rheumatic sore-throat, and that the amount of these anti-bacterial substances reaches its height just about the time that the rheumatic relapse occurs.

We know that streptococci can be the causal organism in infective endocarditis, and that when this happens the blood of the patient develops tremendous antibacterial powers—a high titre of agglutinins and precipitins, and yet such patients do not become skin-sensitive to their infecting organisms. We know too that a hæmolytic streptococcus infection is a frequent prelude to acute rheumatism, and is associated with a raised titre in agglutinins and precipitins in the patient's blood, and skin-sensitivity to streptococcal endotoxin, and an increased blood sedimentation-rate. Yet there is no immunity to subsequent attacks, indeed a definite increased susceptibility. It has been suggested that the ultimate defeat of the protective mechanism in bacterial endocarditis is due to the peculiar situation of the organisms in the heart valves. This is hard to believe, for Lewis and Grant have shown that no less than 26 per cent. of cases of infective endocarditis have congenitally abnormal valves, and Maude Abbott found that no less than 17 per cent. of a series of 555 cases of congenital heart disease died of infective endocarditis. Schlesinger could only find ten cases of infective endocarditis in children under ten years of age during the last 65 years of the Great Ormond-street Hospital records; and acute rheumatism is peculiarly a disease of children. So that it appears certain that acute rheumatism and infective endocarditis are essentially as different in ætiology as they are in clinical features. There is some peculiarity about the rheumatic infection which differentiates it from the various diseases known to be due to streptococci—scarlet fever, erythema nodosum, erysipelas. It may be that some special tissue reaction of the patient is the factor of importance, but a special infection is far more probable. The latest theory is that a virus is the causal agent; this was published by Schlesinger, Signy, and Amies in THE LANCET of May 18th of this year. The suggestion is based upon the discovery of ultramicroscopic bodies in sterile pleural and pericardial fluid from cases of acute rheumatism; and the agglutination of these bodies by convalescent serum. While it is too early to assess the probability of the correctness of this suggestion, it appears to fit in very well with the known facts.

ENVIRONMENT AND PREDISPOSITION

In a few cases the effect of climate upon rheumatic children has been studied experimentally. In New York rheumatism is common, while in Porto Rico it is very rare, so Coburn took ten children from New York where they had had repeated attacks of severe rheumatism to Porto Rico for a period of six months. During the first weeks of their stay in the tropics three of the children continued to have rheumatic symptoms, and improved rather slowly, but then all became symptom-free and remained well for the remainder of their stay. After the return to New York all developed rheumatic recrudescences and two of the children died within eight months. Their diet was unchanged during the experiment, and while in New York they were all given as much sunshine as possible. The outstanding fact learned from this experiment was that in New York the children developed infections of the upper respiratory tract and subsequent recrudescences of rheumatism, and Coburn concluded that the climate of Porto Rico was inimical to respiratory infections and thus protected the children from the recrudescences of their rheumatism.

All the experimental work done so far has not shown one fact which invalidates the suggestion that a streptococcus is the organism responsible for acute rheumatism; indeed, the bacteriological findings and the various experiments with toxins and antibodies all point to a streptococcus infection as an essential predisposing cause. It is certain that the organism is not pyogenic, it is probable that it is non-hæmolytic, and it may be that it is a harmless saprophyte normally which becomes virulent under some special circumstances. These circumstances are not as yet perfectly understood; a change in the organism's essential character, or perhaps an infection of the organism by a virus, or perhaps some variation in the resistance of the patient might explain the known facts.

We know that local epidemics appear in wards as well as much wider epidemics in areas; such local epidemics follow an initial sore-throat, the development of rheumatic symptoms occurring after an interval of 10 to 30 days. The commonest age of onset of rheumatism is about the tenth year, but the condition may appear at any age after the second birthday. Girls are rather more frequently attacked than boys, and there is a definite family incidence (over 200 cases under my own observation show a family incidence of nearly 70 per cent.).

Many experienced clinicians have believed in a rheumatic type of patient—a child who from appearance, colour, and build may be recognised as predisposed to rheumatic disease. These children are possessed of a low resistance to many infections, they take disease severely, and develop rheumatism even in good circumstances. One family of six such children, living under good conditions with well-to-do parents, had most of the exanthemata severely, four mild and two severe attacks of acute rheumatism, and five appendicectomies within ten years. Scarlet fever and diphtheria are fairly frequent precursors of rheumatism, probably because both these diseases appear with special frequency in children with infected tonsils.

Environment plays a most important part in rheumatism, for it is essentially a disease of the poorer classes who live in cities. The importance of cold damp houses has been mentioned, but poor clothing, leaky boots, underfeeding, and overcrowding are at least as important. At first sight it appears curious that the poorest class—the slum-dwellers—do not produce the greatest number of cases of rheumatism, for the disease is seen much more often in the artisan class. The probable explanation is that the high infant mortality-rate in the slums carries off a large number of the susceptible children before they reach the age of rheumatism.

Symptoms

The rheumatic state is not always easily diagnosed in the child, for it may declare itself in any one of several different ways; indeed, some authors have suggested a pre-rheumatic state in which the patient is either losing resistance or gradually being overcome during a prolonged period of incubation. But it seems unnecessary to complicate the picture by such a supposition, for early rheumatism is sufficiently difficult to diagnose and treat successfully. The rheumatic child may be pale and anæmic, listless, tired, one who eats and sleeps poorly and appears to be constitutionally feeble or toxic. Often enough a careful physical examination will show nothing more than this general depression of health. The child may complain of pains, aches about joints or in muscles, made worse by exercise or wet weather, and relieved by warmth, sunshine, or a holiday. These pains may be associated with repeated sore-throats. A characteristic complaint is a right-sided epigastric discomfort not associated with food, often found with a slightly raised temperature and a rather rapid pulse. In other children the infection shows itself by nervous disorders—a child of the quick, bright type becomes unnaturally jumpy or fidgety, and incapable of any sustained attention. Such children are likely to develop insomnia, nocturnal enuresis, tics, night terrors; they react badly to the discipline and stress of school, so that they are especially liable to incur the disfavour of teachers either by their general restlessness or inattention; and as a result may become frankly choreic with the characteristic irregular respiration which precedes the curiously rapid jerky and uncontrolled movements. Lastly there are those who develop frank cardiac signs which usually appear late; often they are recognised only when the heart is already seriously damaged, for the cardiac defect may be the first recognisable sign of rheumatism, although an undiagnosed illness had existed for some time.

Carditis is suggested by malnutrition or actual loss of weight, sweating, and fever, or by a quickened regular pulse—the early disappearance of the normal juvenile variation in the pulse-rate, and a rapid cardiac action during sleep being especially characteristic. The heart sounds change in character, the first sound at the apex becoming soft while the second sound at the base is often accentuated. Next, murmurs appear, the earliest being the systolic murmur which partially replaces the first sound at the apex. Change in the size of the heart in the early stages of carditis is a result of pericardial effusion, and is commonly associated with alteration of the percussion outline of the heart, blurring of the heart sounds, an almost impalpable cardiac impulse, and some degree of pulsus paradoxus. As the heart adapts itself to myocardial damage or valvular defects, enlargement of a permanent nature may appear, and the degree of this increase in size will give a clue to the ultimate prognosis, for the larger the heart the more serious is the damage. Acute dilatation of the heart, as a result of acute rheumatism or any other infection, if it ever occurs, must be exceedingly rare, for years of careful observation and frequent measurement with the assistance of X ray examinations have never shown me a single example of the condition. Nor has any one of a series of keen and critical house physicians ever been able to demonstrate a case in which the heart either expanded or contracted in size within a few days or hours.

Electrocardiographic abnormalities are often present in children with rheumatic carditis, but it is uncommon to find gross abnormalities in the early stages, and most of the defects which appear early disappear or improve under treatment. A minor degree of heart-block is fairly commonly found, and often disappears entirely. Ventricular extrasystoles are sometimes associated with carditis, but may appear in hearts which are otherwise normal, especially in later adolescence. Auricular fibrillation always implies a most serious carditis and an early fatal termination of the disease, but auricular flutter may occur in children who make good recoveries.

Nowadays the fever of acute rheumatism is seldom either high or prolonged, but before the use of salicylates hyperpyrexia and prolonged irregular fever were characteristic signs of the disease. As a rule, the fever settles within a week of the use of adequate doses of sodium salicylate. In the same way both pain and sweating are controlled. Swollen, reddened, and painful joints are characteristic of rheumatism in the adult, but are uncommon in children in whom it is often necessary to handle a joint to elicit pain and discover the periarticular swelling. Sweating is less common in children than in adults, but does occur. It is very rarely severe in a child. Text-books, even by well-known authorities, state that salicylates increase the sweating; this statement is quite untrue, and the cessation of sweating, like the subsidence of the fever, is a sign of adequate salicylate medication.

Perhaps the most characteristic single sign of acute rheumatism is the rheumatic nodule. These nodules appear subcutaneously about the joints, particularly the elbows, knees, carpo-metacarpal joints, wrists, and ankles. They may be found in great numbers or may be very scanty. Sometimes they appear on the scalp about the occiput and occasionally they are found along the iliac crests; frequently they can be felt as peculiar small slightly tender thickenings in the lumbar muscles, even when found nowhere else. The nodule varies in size; generally about the size of a split pea, it may be far larger or smaller, and feels like slightly movable pieces of cartilage, and is almost painless. Usually nodules remain for some weeks, but they may disappear with astonishing rapidity, and almost equally quickly reappear. They used to indicate a very severe type of infection, were associated with pericarditis, and carried a bad prognosis, but latterly they have often appeared in quite mild rheumatism even without any obvious cardiac damage. In several cases they have disappeared under the influence of small doses of Atophan. The peculiar type of inflammation which is characteristic of acute rheumatism may appear in the lung. Indeed, consolidation of this type is by no means uncommon in pericarditis. It may produce few physical signs, or may cause an extensive degree of pneumonia yet without any great disturbance of respiration. Prof. A. E. Naish has made a special study of the rheumatic lung, and finds pulmonary or pleural injury in nearly all fatal cases of rheumatism.

Results of Infection

The characteristic microscopic lesion of rheumatism is the submiliary nodule, a peculiar type of inflammatory focus found only in tissues attacked by acute rheumatism. It is common in heart muscle, endocardium, pericardium, synovial and subcutaneous tissues, and is found in the kidneys, lungs, pia mater, and in the adventitia and media of arteries in many parts of the body. It is perhaps most easily recognised in the myocardium where the nodule forms a striking contrast to the normal muscle and somewhat scanty interstitial tissue.

The characteristic nodule shows four distinct points in its structure :—

1. A poorly staining matrix consisting of fibrin and cellular debris.

2. Certain large cells, varying in shape, elongated or fusiform, with a plentiful deeply staining finely granular cytoplasm and multiple wheel-shaped nuclei (such as are seen in large plasma cells) to the number of from four to ten, although there may be as many as twenty in one cell. These cells are developed from vascular endothelium and may represent sprouts of new capillaries.

3. Plasma cells or fibroblasts.

4. Leucocytes, chiefly small darkly staining mononuclear cells.

The earliest stage of the nodule merely shows a congregation of lymphocytes and plasma cells as the prominent feature, and these may obscure the essentially proliferative nature of the tissue reaction ; but in time the characteristic multinucleated cells appear with their surrounding fibrinous matrix and framework of fibroblasts, and the mononuclear lymphocytes thin out, while later still the lesion is replaced by a patch of fibrous tissue. These foci are always found in association with small arterioles —usually in direct contact in the adventitial or medial coats. They are particularly common in the left ventricle and septum, especially near the base, and appear both frequent and large about the insertions of the mitral valve leaves. The vessels themselves show changes of every degree, local endothelial proliferation is common and may almost occlude the arteriole, yet thrombosis is rare. Sometimes the adventitia is so altered that a cuff of fibroblastic proliferation is seen to surround the vessel like a bead on a string ; and in the larger vessels where nodules appear in the media they produce considerable vascularity with destruction of the normal tissue and ultimate fibrosis. As a result of the rheumatic process the muscle cells of the myocardium undergo striking changes, changes which may be curiously poorly marked to naked-eye examination, and yet are very obvious under the microscope. A species of cloudy swelling, with blurring of the characteristic muscle striation and a diminution of the clear-cut staining of the nuclei is the earliest change. A fatty metamorphosis follows, and is usually present when the rheumatic process has lasted any length of time. And yet, however obvious these changes are, one is always struck by the thought that they seem hardly sufficiently widespread or severe to account for the cardiac failure which was the outstanding clinical feature, and we are constantly aware that our present histological methods are incapable of demonstrating defects of function in highly specialised tissues.

In the chronic case of acute rheumatism—that peculiarly deadly insidious and persistent type which leads to mitral stenosis (it is common to meet patients with mitral stenosis who have never had any symptom of acute rheumatism)—the degree of damage to the muscle may be truly astonishing. Here the auriculo-ventricular junction and the muscle of the auricles themselves is most severely affected, and may be largely replaced by a fibrosis. Where muscle cells remain they may be shrunken and poorly stained, many show fatty globules, and some show patchy pigmentation, although there is nothing like brown atrophy in rheumatism. Emphasis is laid on the condition of the myocardium because it is so important to realise that even in mild cases of rheumatism there is always myocardial involvement, and vascular changes are so marked that some of the smaller coronary twigs always show some intimal thickening. The upper part of the interventricular septum, the neighbourhood of the auriculo-ventricular node and the bundle of His are often damaged, and it is important to state that all observers are agreed that a heart may show both old-standing damage and recent changes which prove that a healed rheumatic process may be associated with a local rekindling of rheumatic inflammation.

Valvular damage is the result of processes of exactly the same histological type as those already described. The endocarditis so commonly seen along the edges of the mitral and aortic valves is always preceded by changes in the substance of the valve leaflets. At the base of the valve, where blood-vessels are relatively numerous, the typical rheumatic nodules appear, and this histological change spreads up into the valve substance ; the common finding of older nodules at the base and earlier stages at the free edges proves that the process advances in this way, and that the valve edge is not infected directly from the blood in the heart. Apparently valvulitis is always a precursor of endocardial thickening at the points of valvular apposition, and the incidence of valve injury depends both upon the vascularity of the valve and the stresses to which the segments are exposed, far greater on the left side because of the higher pressures. The mitral valve is the most vascular, and normally becomes avascular last, the tricuspid is next, then the aortic, and lastly the pulmonary, while stresses affect the mitral valve most, the aortic second, the tricuspid third, and the pulmonary least.

Prevalence of the Disease

Although it is difficult to form any accurate estimate of the prevalence of acute rheumatism in Great Britain, or the frequence of subsequent cardiac disease, it is easy to show certain definite facts by means of figures. G. F. Still found that 13·1 per cent. of his hospital patients suffered from rheumatism, while only 0·7 per cent. of his private patients had this disease, and it is the common experience that in private practice acute rheumatism is a rather rare disease among the well-to-do. G. A. Auden has estimated that 1·4 per cent. of Birmingham elementary school-children have rheumatic conditions—this means nearly 2000 cases of rheumatic infection in children in Birmingham. Sir George Newman has calculated that 0·8 per cent. of all the children attending elementary schools in England and Wales have rheumatic cardiac disease (50,000 cases between the ages of 5 and 14 years.) Carey Coombs showed that 40 per cent. of all heart disease was a result of acute rheumatism and that the average patient with a rheumatic heart died at the age of 28½ years, while no less than 30 per cent. of these patients succumbed between the ages of 11 and 20, and only 7 per cent. reached the age of 50. He found that males do a little better than females at all ages, a result which may in part be due to the influence of childbearing, for while there is no evidence that pregnancy predisposes to recrudescence of rheumatism, it certainly does increase the work of the heart so that the rheumatic mother needs both antenatal care and some extra assistance in the postnatal period if her heart is not to deteriorate. There is definite evidence that repeated gestations do serious damage to women who suffer from mitral stenosis. Coombs also attempted to calculate the incidence of cardiac disease after rheumatism, and states that of children infected before the age of 5 years, nearly half develop heart disease, while among those who first contract rheumatism after 10 years less than a quarter develop cardiac defects. The annual mortality from rheumatic heart disease has been placed as high as 30,000, and as low as 12,000, but it seems probable that the higher figure is more nearly correct.

Rheumatism as its chief result produces heart disease which leads to lessened physical efficiency, produces years of invalidism, and causes early death. Comparatively few of those who have cardiac damage as a result of rheumatism are going to survive to the age of 50 years, and the great majority will be chronic invalids. It is certain that there are in this country more than 50,000 children who have rheumatic heart disease, and not less than 100,000 persons who are cardiac invalids as a result of rheumatism. No wonder that research has been directed to the discovery of the cause and the cure of such a disease, but the chief problem is that of prevention, and the methods by which this may be effected are clear. Among elementary school-children in our cities rheumatism is common; among the same type of children in residential poor-law schools rheumatism is rare; and among the school population of our public schools, male or female, the disease is practically unknown. Eton, a school of 1100 boys, in the Thames Valley, close to the river, has had one case in 17 years.

Treatment

The first step then must be the education of civic authorities so that health may be ensured by well-built houses in sunny smokeless cities which are not overcrowded, and contain spacious suitable play-grounds. The second step should be the education of parents in the wise nurture of children so that their resistance to disease may be high, and good health may be preserved. This implies wise feeding, proper clothing, and adequate changing and drying of wet clothing and boots, as well as the early and careful attention to minor infections, sore-throats, colds, and damaged teeth.

When acute rheumatism, in any of its varied manifestations, does occur it must be recognised early and treated promptly and thoroughly. To-day there are usually three great essentials in treatment. Rest is the greatest of these, and should be complete in the early stages and prolonged if carditis supervenes.

Rest implies that the child is carefully nursed nearly flat in bed, fed and so attended that the patient learns to make no effort or unnecessary movement. In severe carditis it may be necessary to continue this rest for months, and in any case the return to activity should be carefully graduated and watched to see what effect effort has on pulse-rate and cardiac action. By means of really expert nursing the most severe carditis may be prevented from causing serious permanent damage.

The second essential is the removal of foci of infection especially common about the mouth and nose, for infected teeth and tonsils, whether they be the portal of entry of rheumatism or not, depress the general health of children. It may not be easy to decide when a tonsil is infected, but it is certainly abnormal if the glands at the angle of the jaw are enlarged, and such tonsils ought to be removed as soon as is possible having regard to the general condition of the patient, because experience has shown that children with carditis who have had a complete tonsillectomy, and in whom the glands have subsequently disappeared, are definitely less likely to develop serious cardiac defects than those in whom the tonsils remain, or have been imperfectly removed, or the glandular enlargement persists. Tonsillectomy after rheumatic infection has taken place will not prevent recrudescences, but it does tend to protect the heart from the more serious consequences of such recrudescences. Every measure calculated to improve the general condition of health should be employed. The child who puts on weight usually does well.

It has become the fashion to decry or at least belittle the use of salicylates, but there is no group of drugs which has so much influence over the rheumatic infection, nor is there any reliable evidence that any untoward effects follow large doses over a prolonged period. The natural course of acute rheumatism has recently been studied in America by four physicians who watched a series of over 100 children with the disease. These children were not treated with any antirheumatic remedy and the investigators state that they recovered as quickly and left hospital as soon as a series of cases treated by the usual antirheumatic measures. But the history of the condition, especially after 1876 with the introduction of salicin and the almost universal employment of salicylates in treatment, is far stronger evidence than that afforded by this brief study. To a child of 10 years it is quite possible to give grs. 10 of sodium salicylate every hour, or grs. 240 in each day, without any discomfort or even anorexia. To reach this dosage it is necessary to have the child at rest, to allow considerable amounts of fluid with the food; to maintain a milky diet; to ensure a regular action of the bowels; and also to give twice as much of the bicarbonate as of the salicylate of sodium. As children easily tire of any medicine it is useful to give two prescriptions with different flavourings to alternate every two or three hours, and to change the flavouring every three or four days. Salicylates certainly abolish the fever which results from rheumatism; they also remove pain from the affected joints, but they do more than this for they produce a restoration to their normal size and contour and a reabsorption of effusions be they peri- or intra-articular. If then salicylates can produce such effects upon the rheumatic process in the joints, why should not the same result occur in other tissues damaged in like manner? Given in adequate doses salicylate does influence the carditis of acute rheumatism and does modify the course and prognosis of this most serious disease. But every known measure likely to benefit the patient and raise resistance is important, and none can be neglected; tonics, vitamins, and, above all, a prolonged sea visit are advisable—the latter alas often very difficult to arrange. And when all has been done one can only hope that the damage left by the infection will be small, and the resultant incapacity relatively slight.

Let us hope that the future has greater things in store for those susceptible to rheumatism.

DEATH OF ANOTHER AROSA PHYSICIAN.—Following closely on the death of Dr. Amrein, of whom an obituary notice appeared in our last issue, comes the announcement from Arosa, Switzerland, of the death of Dr. Fritz Lichtenhahn, who combined a specialist lung practice with pædiatric work. Many years ago he founded there the Prâsura children's clinic, and he also supervised the treatment of surgical tuberculosis in other institutions. He was only 54 years old.

NEW WARD BLOCKS AT PADDINGTON HOSPITAL.—The construction of a new ward block at Paddington Hospital is necessary in order to provide an adequate maternity unit. The present maternity ward contains only 20 beds, although the number of children born at the hospital rose last year to 500. The new building will consist of four storeys with a central main staircase, and will accommodate 59 more beds. The total estimated cost is £47,760.

THE INDICATIONS AND RESULTS OF PHRENIC NERVE OPERATIONS *

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There are three operations for paralysing the dome of the diaphragm. There is *phrenic evulsion.* It is generally estimated that at least 10 cm. of the nerve must be torn out in order to be sure that the continuity of all accessory nerve bundles with the distal end of the phrenic nerve have been interrupted. Then there is *phrenicectomy.* This operation demands the section of a length of the main phrenic nerve and of all accessory nerves including the filaments to the subclavius muscle. The third operation is the *phrenic crush.* In this operation the main phrenic nerve is crushed and all accessory nerves are divided. The effect of the crush lasts from two to six months or even longer; regeneration may even fail to take place.

The immediate effect of these operations is paralysis of the hemidiaphragm; the muscle-fibres degenerate, and the dome becomes a sheet of fibrous tissue. It takes about four months for this process to become complete.

As a result of the paralysis there are three changes of the dome—namely, a rise into the thorax, a loss of tone, and a cessation of the normal respiratory movements. The dome either becomes immobile or shows paradoxical movements, sometimes with normal respiration but more often only with forceful efforts such as sniffing. Each of these changes has a separate or combined action on the thorax, the lung, and the disease.

Under normal conditions the rise of the diaphragm into the thorax during expiration is due to three factors: the relaxation of the muscle-fibres, the negative pressure in the pleural cavity, and the positive pressure in the abdomen. The descent during inspiration is, of course, due to the contraction of the muscle-fibres. With the dome paralysed, it ascends into the thorax as a result of the difference between the negative intrapleural and the positive intra-abdominal pressures. When the lung is affected by chronic tuberculosis, although there is loss of elasticity of the lung, there are fibrous tissue changes which may more than counteract the loss of elasticity and, other things being equal, will increase the intrapleural negative pressure, and so exert an abnormal upward drag on the dome. Per contra, in a chronic invalid there may be loss of tone of the abdominal muscles and possibly visceroptosis, and the upward thrust on the under surface of the dome will be lessened.

There are other pathological states, however, which may interfere with the post-paralytic rise of the dome. Thickening of the pleural membranes, particularly of the diaphragmatic pleura, superimposes on the dome a tough layer of tissue which yields but grudgingly to the forces above and below; whilst obliteration of the costophrenic sulcus ties down the margin of the diaphragm. When, further, the pleural thickening is generalised and the interlobar septa are also involved, the chest wall itself tends to become contracted, fixed, and immobile, and so scarcely alters the intrapleural pressure during inspiration.

The extent of the rise of the dome varies greatly after phrenicectomy. It may be barely 1 cm. or as much as 10 or 11 cm.; very rarely has it reached a height of 14 cm.

Effects on the Lung

Before we can appreciate the rationale of the indications and the results, it is essential to understand not only the changes in the diaphragm but also the effect of these on the lung and the thorax in general. There is the influence on the lung of the paralysis of the hemidiaphragm, and of the loss of tone. There is also the influence of the rise into the thorax.

The diaphragm, by its descent, is responsible for the expansion of the lower and posterior parts of the lung; with one half paralysed there is the loss of this expansion force. The consequent deficiency of air entry into these areas of the lung can be observed clinically. To the loss of tone must probably be attributed the benefit of the diminution or disappearance of certain symptoms such as the diaphragmatic cough.

The effect of the rise of the dome on the lung is one which has given cause for much conjecture and argument. In the normal lung there is little doubt but that the greater part of the reduction in the hemithorax is absorbed by a collapse of the base of the lung due to relaxation of the elastic tissue; the higher the rise, the greater is the extent of the lung affected, but it is very unlikely to include the apex. If, however, there are consolidation changes at, say, the base of the lung that part is uninvolved, but the nearest areas of healthy lung tissue will contract.

When there is chronic fibrosis in the apex or upper lobe as a result of tuberculosis, a different mechanism comes into play. This mechanism is identical in principle with that found in the production of a selective collapse by artificial pneumothorax. The elasticity of the healthy parts of the lung will cause the partial collapse of the lung, if for any reason the negative pressure is reduced, but the elastic tissue being perfect it will at once yield again to the expanding force of an increased negative pressure. Pathological fibrous tissue is also ready to contract, given the opportunity, and so powerful is its contracting force that it can drag the chest wall and mediastinum towards each other, exerting a force of which the elastic tissue is quite incapable. When a rise of the dome occurs and the hemithorax becomes reduced in size, the elasticity in the adjacent lung fields causes a reduction of these areas; but the fibrous tissue in the upper lung field is even more responsive to the reduction in the hemithorax; it therefore contracts. During inspiration the increase in size of the chest and the increase in the intra-pleural negative pressure calls for a re-expansion of the lung. The elastic tissue responds to this, but the fibrous tissue does not. The result is a gradually progressive selective collapse of that part of the lung which is fibrosed.

There are other factors, however, which have to be taken into consideration. Reference has already been made to the possible impeding influence of changes in the diaphragmatic pleura. Thickening of this membrane must interfere with the rise of the dome, and yet at times it is surprising to what extent the dome may rise after phrenicectomy despite a known thickening of the membrane. The filling-up and obliteration of the costophrenic angle does inevitably tie down the dome.

Further the presence of dense interlobar adhesions, the outer edge of which are fixed to the chest wall and with the radiogram showing a curved outline convex upwards, is almost certain to act as a barrier guarding the upper lobe from influences below it.

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* Read before the North-Western Tuberculosis Society on March 21st, 1935.

Indications for Paralysing the Diaphragm

It is essential, when considering the indications for paralysing the phrenic nerve, to appreciate the object of the operation. There seems to be a prevalent view that it is done for the cure of pulmonary tuberculosis. Profound disappointment must be the fate of those who operate under this misapprehension. Phrenic paralysis often relieves symptoms, especially when it has been correctly advised to this end rather than to the treatment of the disease, but it is not a radical operation for "cure." It is but an asset in the treatment of the disease. Used properly, it is an immensely valuable one, helping to overcome or to diminish mechanical changes which are interfering more or less seriously with the progress of recovery. Like other measures, it is an accessory to sanatorium treatment in the endeavour to increase the resistance of the body to the disease, the effective fibrosing of active tuberculous foci and the obliteration of cavities.

It is often stated that one of the indications for phrenic nerve paralysis is failure of artificial pneumothorax; in other words that a phrenicectomy should be done on every case on which an artificial pneumothorax has been tried and failed. It is possible that I have said this myself in the past, but I now assert emphatically that every case suitable for artificial pneumothorax is not necessarily suitable for phrenicectomy.

Artificial pneumothorax is attempted in cases of pneumonic tuberculosis and also in cases of the caseating, exudative form of disease. Possibly the immobilisation of the dome which has been paralysed may be advantageous in a purely basal case; but, if the base is not involved and is the comparatively healthy part of the organ, phrenicectomy is definitely contra-indicated, since it will bring about collapse of the healthy part of the lung and leave the diseased pneumonic area unaffected.

Then again, artificial pneumothorax is frequently done in the hope of collapsing cavities, usually in the upper lobe or apex. When these cavities are large or are surrounded by dense fibrous tissue, it is expecting almost the impossible to try to obliterate them by a phrenicectomy. The operation is useful for some cavities, but not for this type. Nor is a lung with old-standing fibrosis and one or more cavities likely to benefit by phrenicectomy. If the condition is unilateral, the indication is a thoracoplasty, in some cases without even the preliminary trial of an artificial pneumothorax. A phrenicectomy would be valueless and might even be detrimental.

The indications for phrenicectomy in the treatment of pulmonary tuberculosis are divisible into four groups:—

(1) For the treatment of pulmonary disease. In these cases the extent of the rise is the important factor.

(2) For the treatment of past or present pleural involvement. In this group both the rise and the immobilisation play an important part.

(3) For the treatment of symptoms. In these cases it is not so much the rise of the muscle as the loss of tone and the immobility that is necessary.

(4) In conjunction with other surgical measures.

THE PULMONARY LESION

The chronic fibrotic lesion is one of the types most responsive to phrenicectomy, but it is not all fibrotic lesions of the upper lobe which will respond to phrenicectomy. If the fibrosis is very dense and there are cavities, it will need a very exceptional rise of the dome to influence this, and even with such a rise, failure of an efficient collapse is more than probable. In such cases the cap of the lung is almost always firmly adherent and allows of no shifting of the lung surface; the whole of the collapse requisite to relax the fibrous tissue and to obliterate cavities would therefore have to be obtained by the upward displacement of the central part of the lung as a dome into the apex—an obvious impossibility. The probability therefore of a dense apical cap of adhesions and equally of dense interlobar thickening which acts as a barrier between the upper and lower segments of the hemithorax must be considered contra-indications. These cases, moreover, are eminently suitable for the major operations which will produce a permanent healing impossible by lesser measures.

A moderate degree of generalised fibrosis is, on the other hand, an indication for phrenicectomy. This type of case, even if the condition has been sufficient to produce some flattening of the chest wall and displacement of the mediastinum, may respond most favourably. It is in this group that is found pre-eminently the case which, having made considerable progress with rest in bed, reaches a stage with persistence of cough, sputum, and mild pyrexia beyond which it seems incapable of responding, but after a phrenicectomy improves again progressively and may become symptomless.

Cavities surrounded by dense fibrosis or with thick walls cannot be expected to be favourably influenced by phrenicectomy. Small cavities, on the other hand, without well-defined walls, whether in the base, apex, or region of the hilum, and which have resisted rest in bed, may become obliterated following on a fairly high rise of the dome. The possibility of success is certainly sufficient to justify the operation.

It must be admitted, however, that there are very divergent views on the value of phrenicectomy in the treatment of cavities. Patronikola,[1] for instance, says that out of 100 cases, 4 only were benefited. Russell[2] reports control in 9 out of 24 cases at the Cheshire Joint Sanatorium in which artificial pneumothorax had failed or been ineffective. The results of Nehil and Alexander[3] are very interesting: of 53 cases with a cavity of 2 cm. or less, closure occurred in 65 per cent.; of 63 cases with a cavity of 2–4 cm., closure followed in 36 per cent.; and in 32 cases with a cavity of 4–6 cm., closure occurred in 22 per cent. When the location of the cavity was in the upper third of the lung, closure was recorded in 40 per cent.; of those located in the middle third, 34 per cent. closed, and of those in the lower third, 29 per cent. closed.

Phrenicectomy has many advantages over artificial pneumothorax. It is a single operation and the risks of complications are infinitely fewer; if successful, it does not interfere with future work as may be the case with an artificial pneumothorax. It is pre-eminently the moderately localised proliferative lesion, whether of the upper or lower lobe, which has responded up to a certain stage, yet incompletely, to rest in bed, for which phrenicectomy is indicated as the first line of attack in preference to artificial pneumothorax. The operation should take precedence also in some cases of isolated thin-walled cavities, particularly when a cavity develops in the contralateral lung in a case under treatment by artificial pneumothorax. The combination of phrenicectomy on the one side and of artificial pneumothorax on the other may prove very valuable in the treatment of bilateral disease.

PLEURAL INVOLVEMENT

The second group of cases for which phrenicectomy is indicated is that in which an old or recent pleurisy has been responsible for thickening of the basal costal and diaphragmatic pleural membranes with obliteration of the costophrenic sulcus, and fixation and possibly distortion of the diaphragm. In these cases comparatively little immediate rise can be expected; nor is that the object of the operation so much as the paralysis and loss of tone.

The third group of indications is for the treatment of symptoms, a group far too often neglected. The first and most important, though not the commonest symptom which may call for an emergency phrenicectomy is hæmoptysis. Several cases have been recorded of intractable bleeding for which artificial pneumothorax had proved impossible but which have stopped abruptly after phrenicectomy; in some the bleeding came from the upper and in others from the lower lobe. Alexander gives preference to phrenicectomy over pneumothorax for the arrest of bleeding.

RELIEF OF SYMPTOMS

So far I have discussed the treatment of the disease. With healing there must naturally be improvement of symptoms, lessening of cough and sputum, pyrexia, disappearance of tubercle bacilli, and so on. The improvement in the cough and sputum may occur long before there is time for healing processes to take place. A working diaphragm is not necessary for bringing up and expelling sputum. Often as a result of the disease the dome moves but little, being in a state of tonic spasm, and this actually hampers expectoration. With paralysis of the dome, the full force of the contraction of the abdominal muscles is transmitted directly to the thorax, and facilitates expectoration.

Adhesions between the lung and diaphragm may cause a diaphragmatic cough—a spasmodic cough which is started by movement, laughing, even talking. This can be abolished by paralysing the dome, to the intense relief of the patient and with considerable benefit to the lung. The morning vomiting brought on by the pumping of the dome on the stomach with the initial emptying of the bronchial tubes of accumulated sputum after sleeping can also be stopped by a phrenicectomy.

Patients who have had pleurisy, whether the associated disease is still active or quiescent or healed, may experience dragging aches, pains, or discomfort round the base of the chest. The relief that can be given by paralysing the dome justifies the operation for this alone. Such pleurisies not infrequently implicate the pericardium, when the drag is liable to produce tachycardia on comparatively slight exertion. This too will be relieved by the relaxation of the dome.

AN ADJUVANT TO OTHER OPERATIONS

The final group concerns the indications for phrenicectomy in conjunction with other operative measures. The first to be considered is the combination with artificial pneumothorax. Reactions and effusions during the maintenance of artificial pneumothorax are more likely to occur and recur when there are adhesions which are stretched by each refill. Paralysis and rise of the dome may relax these bands and thus for the time being remove the irritation and lessen the tendency to reaction and effusion. If the adhesion is so placed that the tension is not relieved, no benefit will have been gained as regards these manifestations. Apart from this, phrenicectomy has no benign influence on effusions. It does, however, in certain cases undoubtedly enable the interval between refills to be lengthened.

The rise of the paralysed dome may aid somewhat in cases where the base of the lung is adherent or there is a progressive obliterative pleurisy. A high rise of the dome may be invaluable in certain cases of suspended cavity, converting occasionally an artificial pneumothorax which is a failure into a success.

When a lung, involved by a disease which produces fibrous tissue changes, has been long collapsed and is then allowed to re-expand, a considerable strain must be imposed on the originally diseased fibrotic area and on the walls of old cavities, when that lung re-expands. The hemithorax is admittedly smaller than at the onset, because the chest wall has shrunk and the mediastinum has come across, whilst the healthy alveoli have become emphysematous; yet it seems most advisable further to relieve the strain by raising the height of the dome by paralysing it.

Finally, there is the much debated question of phrenicectomy in conjunction with major operations. There are certain cases in which it is advisable to have the dome paralysed some time before the operation so as to help the cough and expectoration, reduce the pyrexia, and improve the general health of the patient. For these, a preliminary phrenic crush only should be done so that recovery of the function of the dome is returning approximately coincident with convalescence from the major operation. If a total thoracoplasty is indicated the motionless dome will, in my opinion, have a detrimental, rather than a beneficial, effect on the collapsed lung. When the operation is one localised to the apex or upper lobe, the raised dome is more likely to put healthy basal lung tissue out of action than to produce any appreciable collapse of the apex.

It is extremely doubtful if a paralysed dome has any influence in preventing an aspiration pneumonia during the operation. Its other supposed value as a test for the contralateral lung seems to me to be worthless.

The statement has just been made that a phrenic nerve crush should be done in preference to a phrenicectomy whenever the diaphragmatic paralysis is a prelude to a total or localised thoracoplasty or to an apicolysis. The phrenic crush is also the preferable operation in every case where the base of the lung is not affected and the influence on the lesion is of considerable doubt. It is also preferable in cases with bilateral disease when the operation is an emergency one to check bleeding. Matson[4] says that "a return of diaphragmatic function can be expected in 25 to 30 per cent. of all cases, unless all communicating or accessory fibres have been resected." Bonniot and Foix noted a return of function in 8 per cent. when the evulsed nerve was over 10 cm. in length, and in 29 per cent. when the length was under 10 cm. Lindberg[5] found that no improvement resulted when the total elevation of the paralysed dome was less than 3·9 cm. In 80 per cent. of his cases there was a secondary rise averaging 2 cm.; the maximum rise was usually not reached under three months. Matson records a case with an initial rise of 3 cm., a further rise of 6·5 cm. in the ensuing year, and a total rise of 13 cm. by the end of the second year.

Results

Many papers have been written and figures given showing the late results of phrenicectomy with the percentage "cured," improved, and so on. The general opinion is that considerable benefit can be obtained in suitable cases. Yet there are a few like Gravesen [6] who consider "that the actual efficacy of the operation has been greatly exaggerated by many," and that the indications are very limited. He finds that there were "only 27 cases (out of 153 available for 'true statistical analysis') where we have any right to say the patients were healed as the result of the phrenic operation." Those figures are, in my opinion (though not in Gravesen's), most encouraging, because I would again emphasise the fact that phrenicectomy must not be looked upon as a "curative" measure, but as an auxiliary and ancillary measure to other forms of treatment.

For this reason I make no attempt to give figures as to results. It is not possible to produce anything like an accurate statement. In some cases the operation is done with a certainty of benefit to be gained either as regards the disease or the relief of symptoms; in others there is a reasonable possibility of benefit. In yet others a crush is indicated as, while the result is doubtful, there is a possible hope of success. In a disease like tuberculosis, with its disappointments and surprises, this success must be sought for, at times even at long odds.

Complications

Berry [7] collected in 1930 the records of 4697 cases of phrenic nerve paralysis with a mortality of 26 cases. Of the deaths 6 were due to bleeding from extraction of the nerve and 2 to a traumatic emphysema and empyema associated with a traumatic pneumothorax. These 8 cases were unquestionably accidents associated with evulsion of the nerve. Lung embolus and œdema accounted for 3 deaths, and dyspnœa and heart failure for another 3. There were 12 deaths from pneumonia and tuberculous dissemination. Of these 12, 5 were reported by Loewenthal [8] who regarded the condition as an "unspecific pneumonia" due to injury to the pleura while evulsing the nerve. Another possible explanation is that during evulsion the dome gets drawn up into the thorax. At the moment that the nerve filaments give way the diaphragm returns with a sudden, violent descent which may easily cause the aspiration into the lower lobe of secretion squeezed out into the bronchi during the period of elevation. Death from syncope has also been recorded at the moment of evulsion. It is phrenic evulsion not phrenicectomy which is the operation which carries the immediate grave risks. I have seen 3 cases of spontaneous, symptomless, partial pneumothorax occur within a week of evulsion.

The most important of the later complications are those due to the displacement of the stomach and duodenum and the dislocation of the œsophageal opening. Vomiting occurs very occasionally immediately after paralysis of the left dome, but usually subsides in a day or two. Digestive disturbances, flatulence, and borborygmi may last somewhat longer. It is rare for these even to be serious in character or of lasting duration. The most troublesome complication in my series—and I am well on in my second thousand—has been the persistence of borborygmi for eight months, when it rapidly disappeared. Digestive discomfort has been recorded after paralysis of the right dome due to traction on the first part of the duodenum.

Radiological examinations show, according to Longuet and Launay,[9] that with a high rise of the left dome the stomach is elongated and shows a large air space. Of more serious consequence is, however, the condition similar to that found with eventration of the diaphragm, a rotation, producing a partial volvulus of the stomach, causing a constriction across the length of the organ.

Symptoms may therefore be produced by constriction of the œsophagus, of the stomach, or of the duodenum. In the majority of the cases the symptoms are slight and transitory. Very rarely only are they of serious import, and they may then be associated with cardiac or pulmonary manifestations, such as tachycardia or dyspnœa. Dyspnœa of a mild grade may also be observed independently of the above complications. It may persist for two or three weeks and then subside as compensation and adjustment take place.

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CARDIAC HYPERTROPHY IN EXPERIMENTAL NEPHRITIS

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The occurrence of cardiac hypertrophy in the course of an experimental nephritis which is tubular in origin seems to open the way to some new conceptions of the relationship between nephritis and vascular disease.

Gough, Duguid, and Davies (1933) reported the production of a renal lesion in rats by the oral administration of large amounts of orthophosphates in conjunction with overdoses of vitamin D, and the lesion was further described by me in 1934. It is a greatly intensified form of the phosphate nephritis described by Hirsch (1923), and by MacKay and Oliver (1930). Besides becoming chronic and progressive, and producing in some cases extreme disorganisation of the kidney, it has certain important features of interest. For example, although it is primarily and essentially a tubular nephritis, it may in its more advanced stages develop glomerular, and even arterial changes, very similar to those found in man, and it may also lead to a pronounced cardiac hypertrophy.

The lesion can be readily produced in rats by feeding them for 20–30 days on a diet of bread and potatoes, to which has been added acid sodium phosphate (5 parts per hundred, by weight), and at the same time administering a daily dose of 20,000–40,000 units of vitamin D by mouth, in the form of calciferol. At the end of the period of treatment the rats may be put on a normal diet and allowed to recover. They may survive for many months, and most of them develop a chronic nephritis which tends to progress in severity, long after the treatment has been stopped.

The primary lesion is a parenchymatous degeneration, in which focal calcification of the tubules figures prominently. This is followed by a gradual and progressive destruction of entire tubules. Many atrophy and disappear, whilst others dilate and become cyst-like (Fig. 1). Large areas of shrinkage form in the cortex, so that the kidney becomes extremely distorted, with its surface pitted and granular. In most cases the glomeruli remain intact, but in a few of the more severe ones, they undergo changes of an apparently toxic nature. These changes vary, but they usually take the form of hyaline swelling of the capillary membranes, and gradual hyaline transformation of the whole renal corpuscle, similar to that seen in the so-called primary interstitial or primary ischæmic nephritis of man. The endothelial cells of the tufts gradually disappear. Later the whole structure becomes fibrosed and obliterated. When the glomeruli are affected, the arterioles may also be involved. Their walls become thickened and hyaline, and finally when the glomeruli are destroyed, the vessels also become obliterated. It should be noted that no direct relationship seems to exist between the glomerular lesions and the tubular degeneration in this nephritis. The glomeruli may remain intact in the midst of extreme tubular destruction, and when they do degenerate, the degeneration appears to be the result of some additional toxic factor, rather than of the tubular destruction itself. Nor is there any evidence that the glomerular degeneration is the result of vascular disease. Such vascular changes as arise invariably appear to be a later event, and seem therefore to be a result rather than a cause of the glomerular degeneration.

In some of the long-standing and severe cases, changes may also be found in the arteries, especially in those parts where the parenchymatous shrinkage is most intense. Here the smaller interlobular arteries may appear narrow and tortuous, sometimes giving the impression of hypertrophy, but without any degenerative change in their walls. There seems to be little doubt that this change represents a simple contraction. The atrophy which occurs in this disease causes great shrinkage of the tissues, and this must bring about a considerable reduction of the capillary field. Some reduction of the arterial supply is apparently called for, and the changes which occur in the arteries are probably to be regarded as something in the nature of a functional readjustment. One or two of the most long-standing cases have shown some fibrous intimal thickening in addition, but this is a comparatively rare finding.

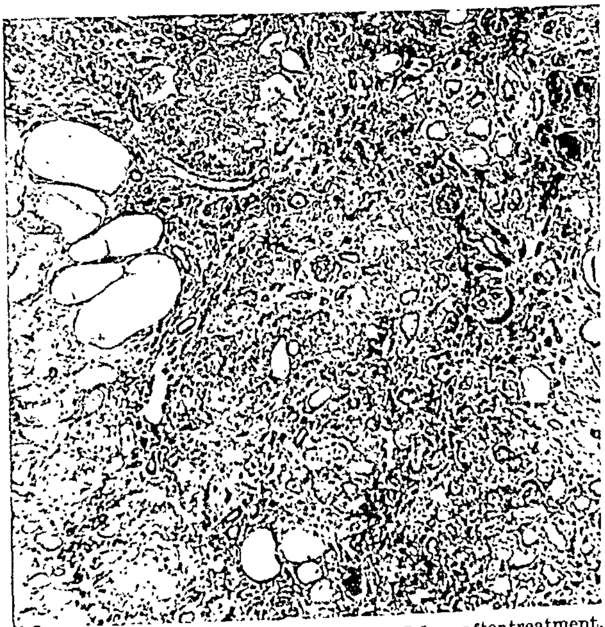

FIG. 1.—Kidney of a rat which survived 67 days after treatment. (× 50.)

It is only in the severe cases, which survive for two or more months after the treatment, that cardiac hypertrophy is found. It takes the form of concentric thickening of the left ventricle very similar to that seen in man. Sometimes the heart increases to more than double its normal weight. Fig. 2 shows hearts of six of the most severe cases, compared with those from normal rats of the same weight. In a group of experiments recently carried out, 160 rats were treated in the way specified above, and 98 of them survived the treatment for more than one month, the rest having died, or having been killed in the early stages, for the purpose of investigating the initial lesion. Of the survivors, 85 showed well-marked chronic lesions, and 23 of them were classified as showing histologically intense nephritis, Fig. 1 showing a typical example. The hearts of these 23 cases were weighed after fixation in formalin. Expressed as percentage of the body-weight they averaged *0·73* with standard deviation 0·15, and extreme range from 0·46 to 1·06. The comparable figures from 60 normal rats were: average *0·43*, S.D. 0·09, and extreme range 0·26 to 0·66.

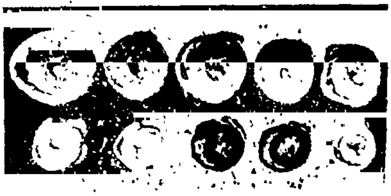

FIG. 2.—The upper row of hearts are from nephritic rats. Those below are from normal rats, each of the same body-weight as the corresponding one above.

These figures become even more striking when calculated in relation to the two-thirds power of the body-weight (i.e., blood volume). For the 23 extreme cases they read: average *3·89*, S.D. 0·78, range 2·57 to 5·21; and for the normals: average *2·18*, S.D. 0·29, range 1·56 to 3·27.

In these 23 rats the amount of glomerular change was variable—in some cases very inconspicuous—whilst well-marked arterial changes were present in less than half of them. Thus, although these figures show beyond doubt that this experimental nephritis in rats has effects on the heart similar to those seen in chronic nephritis in man, they show no evidence that arterial disease is concerned in the process. The cardiac hypertrophy is clearly the result of the parenchymatous destruction, and if an explanation on the lines of vascular disturbance has to be offered, the most likely one would seem to be that the disturbance of renal function produces toxic substances which affect the heart through alterations in the blood pressure.

In man, cardiac hypertrophy is usually regarded as one of the consequences of the underlying arterial disease from which the nephritis itself is supposed to arise. It thus forms part of the basis of the vascular theory of nephritis. The findings in rats are of interest because they call for an entirely different interpretation. In view of them, the possibility of a chronic nephritis with glomerular, arterial, and cardiac changes arising from a primary tubular nephritis has to be considered.

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RESECTION OF THE RECTUM WITH RESTORATION OF CONTINUITY

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In all the older text-books of surgery Kraske's operation for resection of the rectum is described. It is essentially an excision by a sacral approach between the anus and the third piece of the sacrum itself. Originally it was devised so that after resection continuity of the bowel could be restored, but in practice it was frequently found that this was not effected. Either there was too much tension or the blood-supply of the upper segment of the bowel had been so damaged that no repair was possible. Gangrene, followed by an incurable sacral fistula, was the ultimate result. Hence in many cases the operation was completed, not by restoration of continuity, but by the deliberate formation of a sacral anus. In this region the inconvenience of an artificial anus is so great that it is not surprising to find most surgeons abandoning it for the usual iliac colostomy.

The immense advantage of an abdominal anus, combined with a quite erroneous conception of the mode of spread of carcinoma of the rectum, have led to the adoption of two operations for this disease in this country to the exclusion of all others—namely, the perineal and the abdomino-perineal, or lately the perineo-abdominal. It is fair to say that, except for one or two independent advocates of sphincteric preservation, notably Prof. Grey Turner,[1] the English surgeon has been obsessed by the opinions of those writers who, without observational justification, have insisted upon the necessity in every case of sacrificing the whole of the bowel below a carcinomatous growth, together with all the fat and pararectal tissue in the ischiorectal fossæ. The objectionable qualities of any artificial anus have been allowed conveniently to sink into the background. Some accounts would make us believe that a man with an iliac colostomy, when properly performed of course, suffers from little, if any, disability or inconvenience; we are almost persuaded that it is an advantage. Such adulatory accounts, however, always come from the surgeon. I have yet to meet a patient who contemplates with complete satisfaction and equanimity his possession of an artificial outlet for his fæces. The waste of time each morning in emptying his colon that he may pass the remainder of the day in comparative comfort, the ever-present possibility of involuntary escape of solid or gaseous contents, the constant attention to his diet are not trivial matters. The revolting nature of these daily attentions is extraordinarily disturbing to a man of culture and refinement, and is apt to induce a most unpleasant state of mind, a condition which may best be described as a stercoral outlook on life. No normal man could contemplate a colostomy with anything but dismay.

Twelve years ago an educated woman with carcinoma recti came to see me. She knew the nature of the disease and the operative implications had been explained to her. She refused to consider for one moment a colostomy and begged me to avoid one or do nothing. This was the first case in which I performed a sacral excision of the rectum with restoration of continuity. It was a complete success so far as local removal went, but the patient succumbed some two years later to a metastasis in the liver. Since then I have carried out the operation with what must be considered, when results are taken into account, a quite discreditable infrequency. It is the realisation of this delinquency which leads me to urge a more extensive trial of the method, particularly as recent pathological investigations afford a complete justification for disregarding the alleged necessity for extensive removal of the perirectal tissues.

Pathological Considerations

These pathological investigations are due particularly to Westhues and Schmieden in Germany,[2] and to Cuthbert Dukes in this country. The essential facts are few and simple. Lymphatic flow from the rectum is preponderatingly—one may with some justification say, exclusively—in an upward direction along the course of the superior hæmorrhoidal vein, up into the glands of the mesosigmoid, and thence into the aortic glands. No lymph travels laterally to the walls of the pelvis and none passes downwards and out to the inguinal glands unless the growth encroaches actually upon the anal canal. Only the glands in the mesosigmoid need concern the operator, but it is essential that the tissue behind the rectum in the hollow of the sacrum be effectively removed.

A second pathological fact of very great importance is the recognition of the small part that local permeation in the actual wall of the rectum takes. The bowel is quite free from carcinoma cells 1·0–1·5 cm. below the macroscopic margin of the growth; a somewhat wider margin may be required above. Sometimes in more advanced cases a blunt-shaped process grows right through the rectal wall more frequently posteriorly or slightly to one side. This mass is in continuity with the main growth and usually inclines orally along the bowel. Never in specimens obtained at operation does it extend through the visceral layer of pelvic fascia which lies behind the rectum. The corresponding process in front either pushes the peritoneum of the fold of Douglas upwards or grows through it forming the umbilicated appearance in this region familiar to all surgeons. The part played by the pelvic fascia in limiting the spread of carcinoma is very important, and its bearing upon operative procedure will be referred to again. It may be noted here that whilst it is an almost certain barrier behind it is not quite so impenetrable where it forms the recto-vesical layer in the male. Occasionally in an operable stage, growth will have invaded the prostate. It is very rare to find it encroaching actually upon vaginal tissue. Carcinoma of the anal canal is not so confined by facial layers; it spreads easily into the perirectal tissues. It is much more difficult to eradicate locally.

Anatomical and Operative Considerations

It is clear that to make an effective removal of a growth above the anal canal it is not necessary to take away much of the rectum above and below the apparent margin of the carcinoma. It is quite sufficient to cut the bowel across 1·5 cm. below the growth with the assurance that no cancer cells will remain behind. Above, it is advisable to take away 1·0 cm. more. The tissue in the neighbourhood of the middle hæmorrhoidal vessels is innocuous and should be left, but free removal of the tissues behind the rectum extending up the whole extent of the mesosigmoid is absolutely essential for success.

The visceral layer of pelvic fascia, being a natural barrier to the spread of the growth, it is wise to keep outside this layer as far as is possible. It arises, it will be remembered, from the white line at the side of the pelvis and passes medially upon the upper surface of the levator ani and coccygeus towards the rectum, seminal vesicles, prostate, and bladder. Reaching these viscera it spreads out over them and between them, the strongest septum being that separating the prostate from the rectum. In dissecting the rectum from the prostate in front by the sacral approach, the visceral layer must be incised longitudinally on each side of the rectum anteriorly. This fascia is disclosed as a glistening membrane almost like peritoneum after the levatores ani have been divided close to the bowel. Unless it be incised in this manner it is difficult to find the proper interval. The separation takes place actually behind the thick septum between the rectum and prostate. If the fascial investment of the rectum be traced downwards it will be found to be reflected laterally on to the upper surface of the pelvic muscular diaphragm, as described above, and behind to be reflected on to the anterior surfaces of the coccyx and sacrum. It thins off as it is traced upwards to the promontory of the sacrum and the first lumbar vertebra, where it disappears as a distinct layer. It is between this layer of fascia and the peritoneal reflection on to the sides of the rectum and pelvic colon that the lymphatic glands and tissue lie which must be removed in the operation for carcinoma. The middle sacral artery lies on the outer surface of this layer of fascia sometimes adherent to it. The superior hæmorrhoidal artery should be ligated at the safe point above the origin of the lowest sigmoid branch. This will be accomplished if the artery be tied just above the promontory of the sacrum or at a higher level. At the point where the lower section is made in removing a growth the rectum has no peritoneal investment.

The Choice of Operation

There are two ways in which a resection may be carried out, by a sacral approach or by a combined abdominal and sacral method. The Goetze operation based on the above considerations is adequate and effective. It may be briefly described.

SACRAL RESECTION BY GOETZE'S METHOD [3]

With the patient in the left lateral position, a median incision from just behind the anus to the middle of the sacrum is made. The coccyx and the sacrum below the third pair of foramina are removed. Deep to them will be found the sacrum invested with the visceral layer of pelvic fascia in the outer layer of which runs the middle sacral artery. This fascia is easily stripped off the hollow of the sacrum up to the promontory allowing the rectum to fall forward. The pelvic fascia is divided longitudinally about the level of the middle of the sacrum at 3–4 cm. to the right of the left lying rectum. Underneath will be found the loose fat of the extraperitoneal tissue which is easily pushed aside to expose the peritoneum itself. This is opened here. A similar dissection to the left but closer to the bowel will open the peritoneum on that side. The rectum is now pulled downwards and forwards to stretch the tissue lying behind it in which lies the superior hæmorrhoidal artery. This vessel is divided between two ligatures at the level of the promontory. When this is done the gut is immediately liberated and comes down with a jerk. It is now quite easy to join the two side openings in the peritoneum across the rectovesical pouch and to separate the rectum from the strictures in front working from above downwards. This separation lower down will be facilitated by bearing in mind the anatomical points mentioned above.

When the growth has been separated above and below it can be excised and an end-to-end suture carried out as described later. If it should be found impossible to bring enough of the intestine down for this purpose Goetze recommends that the upper end be sutured in the posterior wound; this is a weak point in the procedure. Another weakness is that it is not possible working from below to assure oneself of the state of the blood-supply of the upper segment of bowel. Again, if the growth has pushed up the peritoneal reflection or penetrated the rectovesical pouch the difficulties are immensely increased. Moreover, we remain quite in the dark as to the presence of other metastases in the abdomen. For these and other reasons a combined abdomino-sacral operation is much to be recommended.

THE ABDOMINO-SACRAL RESECTION

I have not performed this operation many times, but its advantages appear to me to be so great that I do not hesitate to recommend it. With the abdomen open it is possible to inspect the condition of affairs *from above (see, Figure)*, *particularly* any *spread* of the growth to the peritoneum, and the size of any metastases in the lymph glands. Though umbilication of the rectovesical fold is not an absolute contra-indication to excision the spread of the growth in these cases is always extensive. A bowel apparently fixed to the sacrum is often easily separated with its investing visceral pelvic fascia. Very important is the ease (unless the patient be too fat, when the wisdom of this operation is doubtful) with which the point for ligature of the superior hæmorrhoidal artery may be selected so as to preserve the blood-supply of the rectum; also the line along which the mesocolon should be divided to allow of a piece of bowel being brought down without tension to make the anastomosis. When the abdomen is opened it can be seen at once if a resection with restoration of continuity is precluded because of an unusually short mesosigmoid. Under such circumstances there must be made an inguinal colostomy and sometimes the operation of removal of the growth may be completed wholly from above.

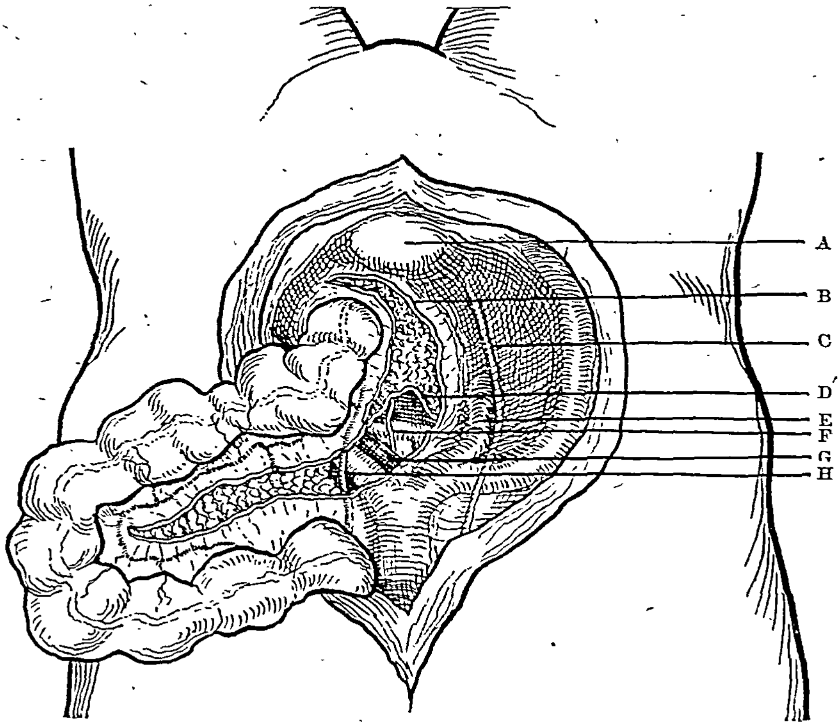
The objection to the ordinary abdomino-perineal excision of the rectum is that it is productive of much surgical shock does not hold for the abdomino-sacral operation. My experience with this and the purely sacral excision is that shock is much less when the sphincteric region of the rectum is not interfered with.

The steps of the operation are simple enough.

When the abdomen has been opened and the operation deemed to be feasible, the peritoneum of the mesosigmoid is incised at a point in the neighbourhood of the apex of the sigmoid loop so situated that the important arterial arcades remain between it and the margin of the bowel. Thence the incision proceeds to the promontory of the sacrum, then along the root of the mesosigmoid, around the floor of the pelvis, and across the rectovesical pouch to join a similar incision on *the other* side of the pelvis. The only difficulty in this is the depth at which the incision is made and the narrowness of the pelvis. It may be facilitated by dragging forwards with suitable forceps the bladder in the male or the uterus in the female. The superior hæmorrhoidal artery is then ligated and divided at the safe point about a centimetre above the promontory *of the sacrum*. The *fatty* tissue of the mesosigmoid is divided towards the bowel wall corresponding with the peritoneal incision. By a little careful dissection just below the sacral promontory it will be found possible to strip the hollow of the sacrum free, keeping behind the visceral pelvic fascia down as far as the tip of the coccyx. At the side the upper margin of the levator ani is passed. It does not seem necessary always to dissect out the ureter, but if there is any uncertainty about its position this may easily be done. At the sides of the rectum low down is the pelvic fascia which must be cut to free the bowel. No hæmorrhage of any consequence occurs in this situation. In front, separation from the vagina or bladder, seminal vesicles, and prostate is not so easy. It cannot be done here altogether by blunt dissection or with the fingers. The help of scissors is required.

When the rectum has been separated on all sides as low down as possible, by trial, the upper point of division of the colon is selected so that it will extend easily down to the distal stump. When this has been done the mesosigmoid must be severed to this point at such a distance from the bowel margin that the necessary arterial arcades are preserved. This is one of the great advantages of the abdomino-sacral route.

The separated bowel is now pushed down into the pelvis whilst the peripheral margin of the peritoneum is sutured around it and to the mesosigmoid so as to shut off the abdominal cavity completely. The abdominal wall is sewn up. With the patient on the left side with the knees drawn up, an incision is made from just behind the anus to the posterior aspect of the lowest part of the sacrum. The coccyx only need be removed—another advantage. It is usually quite easy then to deliver the separated growth, rectum, and lower part of colon. Some dissection is needed to detach the rectum in front. It is carried out by dividing the levator ani on each side about 1 cm. from the median line but only so far downwards as is absolutely necessary. The glistening pelvic fascia beneath this is divided longitudinally on each side just behind some vessels which can usually be seen through it and mark the prostatic plexus or at a similar place in the female. Only 1·5 cm. of rectum below the growth need be removed. The upper section takes place at the already selected point. The intervening portion includes all the tissue behind the rectum up to the sacral promontory as well as the growth itself. This is all that it is necessary to remove. The anastomosis is performed in the usual manner in two layers, the anterior aspect being done first.



Parts displayed in the abdominal stage of the resection: (A) bladder, (B) peritoneum, (C) ureter, (D) visceral layer of pelvic fascia, (E) internal iliac artery, (F) middle sacral artery crossing promontory of sacrum, (G) common iliac vein, (H) superior hæmorrhoidal artery.

Although I have taken the usual precautions to protect surrounding tissue with sterile cloths, I have never got primary union without a fæcal fistula for at least a few days. It is essential to pass a tube up the rectum past the anastomosis. Although its use can be dispensed with I do not recommend that this should be done. In one of my patients intestinal obstruction came on; she was much distended and had severe colic with vomiting, which was relieved immediately by the passage of a rectal tube. Evidently the colonic portion may suffer temporarily from a physiological obstruction. Drainage must be provided for from the posterior sacral wound. Although some suppuration always occurs I have not yet had a persistent fæcal fistula.

Some surgeons fear a stricture at the site of the anastomosis. The following observation is of interest in this connexion.

In one man I felt that a preliminary colostomy was desirable because of obstruction. When this has to be done I think the second stage should be a purely sacral operation, though I am not sure that it would be altogether unsafe to do the combined operation provided an efficiently large drainage-tube be passed through the anus past the anastomosis. However in this particular man a sacral resection was performed. It resulted in a stricture which would not quite admit the middle-joint of my index-finger. Every two weeks it was digitally dilated for one year but no progress was made. At this time the patient begged me to close his colostomy, which I did. To my surprise no difficulty from the stricture was experienced, and three months later the stricture had dilated up purely by natural use so that, to the finger, it was almost imperceptible.

I have no large series of such operations to report, but those I have done have been extremely satisfactory. The condition and happiness of the patients is incomparably better than if a permanent colostomy had been made. It is with the hope that the operation will become more general that this communication is made. It deserves a wider trial, it is based upon sound pathological observations, it results in a normally constituted individual, it is not difficult to execute, and it does not seem to be associated with great shock.

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FIRST AID BY PARACHUTE.—It is announced that several doctors and nurses at the Botkinski Hospital in Moscow have pledged themselves to learn parachute jumping. Their intention is to attend urgent medical cases in remote areas where there are no suitable landing places for aeroplanes.

RHEUMATIC HEART DISEASE AND VITAMIN C

BY C. BRUCE PERRY, M.D. Brist., M.R.C.P. Lond.
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF BRISTOL

IN 1933 Rinehart and Mettier[1] described changes in the joints and heart valves of scorbutic guinea-pigs when infection was superadded to the vitamin deficiency. Somewhat similar changes on a much smaller scale were found in some animals with uncomplicated scurvy, but infection alone produced no such changes. These authors were struck by the similarity of these pathological changes to those of acute rheumatism. Further investigations[2,3] supported the original observations, and they suggest that rheumatic fever may be the result of the combined influence of scurvy and infection. In a discussion of the known facts with regard to the ætiology of acute rheumatism in childhood, Rinehart and Mettier point out that the theory that vitamin-C malnutrition may be a factor in its production might explain much of the curious social incidence of this disease. The possibility of the existence of "subclinical scurvy" amongst apparently normal children has been raised by the work of Göthlin[4] and others (Dalldorf[5] and Stocking[6]). All these investigations are based on the "capillary resistance test" or Rumpel-Leede phenomenon. The test was originally described by Rumpel[7] and Leede[8] as occurring in scarlatina and consists in the artificial production of skin petechiæ by placing a tourniquet on the arm at varying pressures below the systolic blood pressure and thus producing venous congestion. In 1914 Hess and Fish[9] described this test in infantile scurvy but they stated quite definitely that "the capillary resistance test is brought forward not as a specific test for scurvy but rather as a method of bringing to view a weakness of the vessel walls whatever may be the cause."

The assumption that a decreased "capillary resistance" is an indication of subclinical scurvy in apparently healthy people is, therefore, open to much criticism. Hess[10] has recently again stressed the fact that the capillary resistance test should not be taken in any way as a criterion of vitamin-C deficiency, and Greene[11] has been forced to the same conclusion. Although the evidence for the existence in the general child population of subclinical scurvy is very insecure it appeared desirable to investigate rheumatic children for any evidence of vitamin-C malnutrition in view of Rinehart and his colleagues' conclusions and suggestions.

THE INVESTIGATION AND ITS RESULTS

Harris and Ray[12] have described a test for vitamin-C deficiency based on the excretion of ascorbic acid in the urine after the administration of a test dose of vitamin C. The test was carried out as follows:—

> At 6 A.M. 500 mg. of synthetic ascorbic acid was given in water by mouth and the urine was collected at two-hourly intervals for 12 hours. The urine was measured as soon as passed and made acid by the addition of 10 per cent. by volume of glacial acetic acid. The estimations were carried out as soon as possible, and always within six hours. 0·05 c.cm. of a 0·05 per cent. solution of 2 : 6 dichloro-phenol-indophenol (equivalent to 0·01275 mg. ascorbic acid) was taken, and the amount of acidified urine required to decolorise this determined. If less than 0·02 c.cm. of urine was required the urine was diluted with a 10 per cent. solution of glacial acetic acid.

This test has been criticised by Parsons[13] on the grounds that ascorbic acid is not the only substance that occurs normally in the urine which reduces the dye used (2 : 6 dichloro-phenol-indophenol). If the criticism is correct it does not invalidate the value of the test since it is the increase in the vitamin-C excretion following a test dose that is important, and this may reach some ten times the basal output. Five cases of active rheumatic heart disease and six quiescent cases have been studied by this test (see Table).

TABLE SHOWING ACTIVE CASES

A.A. =Ascorbic acid excreted in urine in 12 hours after test dose of 0·5 g. (in mg.).

C.R. =Capillary resistance (Göthlin). Number of petechiæ after tourniquet at 50 mm. Hg for 15 minutes.

E.S.R. =Erythrocyte sedimentation-rate. Fall (in mm.) at the end of one hour in a 10 cm. column of blood.

	Sex.	Age.	Date in 1935.	A.A.	C.R.	Clinical condition.	E.S.R.
1	M	14	Mar. 19	A.A. given but urine not collected by mistake.	0	Fifth day of first attack of rheum. fever, arthritis, and pericarditis.	22
			Mar. 21 Apr. 16 (*a*)	6·5 142	3	April 3 : fresh rise of temp. with pericardial rub which persisted till April 18.	47
2	M	12	Mar. 21	48 (some urine lost)	1	Rheum. heart dis. Acute relapse with arthritis and pericarditis.	50
3	F	9	Mar. 28	99	0	First attack of rheumatism, fever, arthritis, and carditis.	45
			Apr. 16 (*b*)	118	0	April 18 : relapse with fresh fever and increase in cardiac physical signs.	51
4	F	15	May 17 May 18*	9 9·7	0	Chorea and carditis three weeks after tonsillitis and otitis media.	50
			May 28 (*c*)	146	0	Chorea less and cardiac physical signs decreased.	20
5	M	12	July 15	77	4	Rheum. heart dis. Acute relapse, with fever, arthritis, and carditis (partial heart block).	54
				QUIESCENT CASES			
6	F	14	Mar. 18	196	2†	Rheum. heart dis. No clinical evidence of activity.	3
7	M	12	Mar. 19	60 (some urine lost)	0	Old chorea and rheumatism. No clinical evidence of activity.	5
8	M	17	May 28 May 29*	8·5 7·4	2	Rheum. heart dis. No clinical evidence of activity.	3
9	F	14	May 28 May 29*	13·6 24·4	1	Rheum. heart dis. No clinical evidence of activity, slight attack of chorea in April.	5
			June 17 (*d*)	341	0		4
10	M	11	May 30 May 31*	5·5 10	1	Rheum. heart dis. No clinical evidence of activity.	4
			June 1*	78			
11	F	10	June 15	77	8	Rheum. heart dis. No clinical evidence of activity.	3

(*a*) After 26 days' full diet.
(*b*) After 19 days' full diet.
(*c*) After 0·5 g. ascorbic acid daily for 8 days.
(*d*) After 0·5 g. ascorbic acid daily for 15 days.
* Repeat test.
† Twenty days previously while menstruating 40.

Of the five active cases three showed a marked rise in the excretion of ascorbic acid following the test dose, and were thus presumably in no way deficient in this vitamin. Two cases showed no response despite the repetition of the test, in one case on the next day and in the other after one day's interval. One of these children was given 0·5 g. ascorbic acid daily for 8 days and then retested when there was a large amount excreted. The other was retested after 26 days on a full diet and showed a normal response. It is interesting to note that just before the second test this child suffered an acute rheumatic relapse. All of these cases had a normal capillary resistance as judged by Göthlin's standards.

Of the six quiescent cases three showed a satisfactory rise in the excretion of vitamin C after the test dose. One of these cases gave a positive capillary resistance test (8 hæmorrhages in a 60 mm. circle at the bend of the elbow after a pressure of 50 mm. Hg for 15 minutes). Another, 14 days before the test, while menstruating, had a much impaired capillary resistance (40 hæmorrhages after 50 mm. Hg pressure for 15 minutes) but at the time of the test this had returned to within normal limits (2 hæmorrhages). (Vogt [14] has shown that there may be decreased capillary resistance at the onset of menstruation.) In one case there was no response to the first and second test but the repetition of the dose of vitamin C on three consecutive days finally lead to a satisfactory excretion. The capillary resistance in this case was normal. Two cases showed no response to the test dose of ascorbic acid even although the test was repeated on the following day. Both of these children also had normal capillary resistance. One of these two received 0·5 g. of synthetic vitamin C daily for 15 days at the end of which time the test showed a very large excretion of vitamin C. Thus of the active cases two, and of the quiescent cases three, showed evidence of vitamin-C malnutrition.

These findings afford no support for the theory advanced by Rinehart and Mettier that vitamin-C deficiency plays an important rôle in the causation of acute rheumatism. This is in accord with Faulkner's [15] observations that the administration of large doses of vitamin C failed to affect the course of rheumatic fever, although the same author found that cases of rheumatic fever developed a slight reticulocytosis, analogous to that seen in the anæmia of scurvy but on a much smaller scale, following the administration of the vitamin. Faulkner from his studies concludes that any infection may increase the demand for vitamin C and that deficiency may develop secondarily, but that deficiency of vitamin C is *not a factor in the ætiology* of rheumatic fever. Warner and Winterton [16] have come to the same conclusion from a dietetic study of rheumatic children. While this investigation casts doubt on Rinehart and Mettier's suggestions and also on the claims of those who regard the capillary test as a delicate index of vitamin-C deficiency, since all these cases showing evidence of unsaturation with vitamin C had normal capillary resistance tests, it does suggest that some degree of vitamin-C deficiency is not uncommon amongst children with active and quiescent rheumatic carditis.

CONCLUSIONS

(1) Vitamin-C deficiency is not an important factor in the causation of acute rheumatism. (2) Mild degrees of this deficiency are not uncommon in rheumatic children. (3) The capillary resistance test is not a reliable guide to this deficiency.

Thanks are due to the sisters and nursing staff of the Bristol Children's Hospital and Bristol General Hospital, without whose assistance in collecting the urinary specimens this investigation would not have been possible.

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Clinical and Laboratory Notes

INCONTINENCE OF FÆCES IN A YOUNG GIRL

By J. Hartsilver, M.R.C.P. Lond.

A GIRL 8 years of age was brought to me on June 11th, 1935, with the complaint that she was unable to control her motions and had been continually soiling her clothes and bed for three weeks, by which she was much distressed.

About three actions occurred during the 24 hours, and the child was occasionally conscious of the act. There was slight loss of weight, appetite was poor, and she had occasional bilious attacks. A year previously the patient had come from India where she had enjoyed good health. Before the trouble began both she and her sister had been treated elsewhere for warts by means of carbon dioxide snow and the electric cautery, and it was stated that "both children suffered great pain and were terrified of the treatment." As a rule they were not easily frightened, having been brought up in the "wilds."

Examination.—A healthy, well-nourished girl, very alert, and bright mentally. Eyes, tonsils, and teeth, nothing abnormal found. Tongue coated with fur, breath heavy. Neck, chest and abdomen, perineum and rectal examination: nothing abnormal. Motions: dark and formed; no thread-worms seen; no signs of other parasites. Reflexes (upper and lower extremities and epigrastic) normal; no ankle-clonus. Urine: acid; specific gravity, 1013; no albumin or sugar; acetone ++ in two examinations. No signs of rheumatism.

Progress.—Shortly after this examination chicken-pox developed. Bed and a milk diet were suggested to the mother, and the girl was asked to pass her motions at regular periods, three times a day. When conscious of the act she was to try to stop defæcation till she was able to use a chamber. She readily agreed to do this. Potassium citrate was given for the "acidosis." Recovery was almost immediate and uneventful.

It should be mentioned that the younger sister was also upset by the treatment for warts but did not suffer in any other way.

Assuming a maximum incubation period of 21 days for chicken-pox, there is a remote possibility that the incontinence was due to an associated infection of the central nervous system; but there were no signs of this uncommon complication. There remains the definite history of the fright and nervous upset from the carbon-snow treatment.

When associated with enuresis, fæcal incontinence is usually confined to the daytime, whereas enuresis, if not occurring throughout the 24 hours, is nocturnal only. Causes enumerated in the text-books include extreme asthenia in severe illness, impending death, extreme fear, collapse or shock, and central nervous disease such as poliomyelitis, spina bifida, paraplegia from myelitis, or damage to the brain or spinal cord; also damage to the nerves or muscles of the pelvic floor. As a rule however the condition is clearly functional in origin, since almost all the children affected are highly nervous, often suffering from night terror, insomnia, stuttering, or habit spasm. It may also be associated with rheumatism. Other causes are said to arise locally—intestinal disorders, threadworm, and colic or weak or dilated sphincter. The condition should, I think, be distinguished from "constipation with incontinence" as described by Thorling, Bloch, and D. Hubble,[1] which seems to be primarily due to overflow from an overloaded rectum. Here also, however, there must surely be a nervous factor in operation, since loaded rectums are common, but reported cases of constipation with incontinence are evidently extremely rare. In my own patient no constipation had been noted before the onset of the incontinence (which was comparatively abrupt), and fæces were not found in the rectum.

In treatment Still[2] advises Dover's powder grs. $1\frac{1}{2}$–3, according to age, and belladonna, bromides, and arsenic; also a diet avoiding foods likely to irritate the bowels such as fruit and vegetables.

I am indebted to Dr. A. Blair Griffiths for permission to write this note on his patient attended during his absence.

Hove, Sussex.

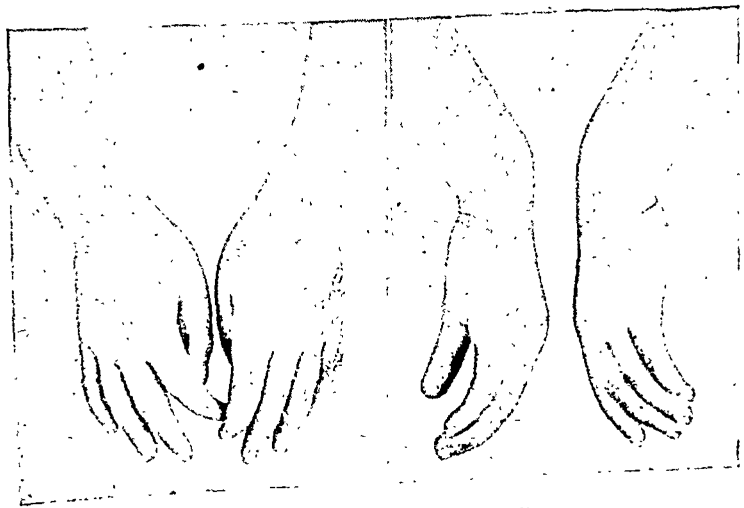
MADELUNG'S DEFORMITY

By Sami Barsoum, M.D.

OF THE AMERICAN MISSION HOSPITAL, ASSIUT, EGYPT

A girl about 12 years old came to our free clinic on April 4th, 1935. It had been noticed about a year before that she had no strength in her hands and would drop things that were at all heavy. It was also noted about that time that there was abnormality in the shape and mobility of the wrists, which are very weak. The accompanying photographs show the conspicuous volar displacement of both hands and carpal regions, with abnormality in the mobility of the two wrist-joints. The deformity is almost or entirely symmetrical in the two wrists. There is some pain with forced movement of the joints. Abnormal curvature of the radii may also be observed with apparent thickening distally and an unusual carrying-angle of the forearm.

The case was referred to Dr. Giffen, director of X ray and laboratory department, and his films helped in the diagnosis of Madelung's deformity. Other joints and bones of the body seem to be normal, though no radiological examination has been made beyond the forearms and hands.



Photographs showing the deformity.

RUPTURED URETHRA

AN UNUSUAL ACCIDENT AT SEA

By H. C. Hopkinson, M.A. Camb., M.R.C.S.Eng.

While acting temporarily as ship's surgeon on the North Atlantic run, the following case came under my care.

We were two days out from St. John, New Brunswick, homeward bound; the weather was stormy from March gales, and the decks slippery from constant spray. A young Scotsman, aged 20, while running across the deck, slipped, lost his balance, and slithered at considerable speed against the iron upright of some railings before the after-hatch. His position was such that he collided with the iron stanchion with his legs apart, one on either side of it, so that he received the full force of the blow on his perineum.

The young man was tough and plucky, and took no notice of the accident until two hours later, when, on attempting to pass water, he found that he was unable to do so, and that there had been a considerable oozing of blood from the meatus of his penis. Thereupon he came to the surgery and I diagnosed traumatic rupture of the urethra. It was impossible (or, at any rate, I was unable) to pass a Jacques rubber catheter, but after some difficulty I succeeded in passing a silver catheter No. 8. This was tied in, and remained in situ for five days. The patient must have endured considerable discomfort meanwhile, for the sick-bay was situated in the extreme stern of the vessel on the upper deck, and the weather was such that on two occasions the patient's dinner was swept out of the hands of the hospital attendant while crossing the after-deck.

On arrival at Greenock I removed the catheter and put the patient ashore on a stretcher. He made a rapid recovery, and was discharged from hospital ten days after the accident.

Had the urethral rupture been complete no instrument could have been passed; and the case illustrates the advisability of exploring with a metal catheter before assuming completeness of the rupture.

Royal Mineral Water Hospital, Bath.—When this hospital is moved from its present site to the new one near the baths a large area of slum property will have to be cleared. It is thought that the new building should accommodate 300 patients. A sum of £50,000 will be needed for a laboratory, and the total expenditure will be about £250,000.

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[1] See The Lancet, 1932, ii., 927, 971.

[2] Still, G. F.: Common Disorders and Diseases of Childhood, London, 4th ed., p. 843.

REVIEWS AND NOTICES OF BOOKS

The Rheumatic Diseases

Their Recognition and Treatment. By FRANCIS BACH, M.A., M.D. Oxon., Chief Assistant, St. Bartholomew's Hospital and the British Red Cross Society's Clinic for Rheumatism; Specialist in Rheumatic Diseases, St. Stephen's Hospital (L.C.C.). London: Cassell and Co., Ltd. 1935. Pp. 436. 12*s.* 6*d.*

CLOSE on the heels of the first report of the Royal College of Physicians' committee on chronic rheumatic diseases appears this volume, written by one of its members. It is a careful survey of everything that goes by the name of rheumatism, based on clinical experience and extensive study of the literature. Dr. Bach deplores the neglect of chronic rheumatism and its treatment by the teaching schools, which have rarely roused the student's real interest in the subject and have too often sent him into practice lamentably ill-equipped to deal with a prevalent and disabling condition. He observes that comparatively few specialists, of training and competence comparable with those of the first-class general physician, neurologist, or chest specialist, have in the past been engaged in this branch of medicine, and he contrasts the thoroughness with which the community, both lay and medical, organises the treatment of pulmonary tuberculosis with its apathy towards the rheumatic diseases which cause one-sixth of the industrial invalidity of the country. Such considerations seem to be his motive in preparing these descriptions of the main types of rheumatism, covering their clinical, pathological, radiological, and biochemical aspects, as well as describing their treatment. The book is too full to appeal to most general practitioners, but is to be warmly recommended to all the younger teachers of medicine, to the budding physicians, and especially to those who feel specially drawn to the problems of rheumatism.

The opening section deals with the general anatomy and physiology of skin muscles and joints, and with the investigation of the patient. So much space is given to recapitulating the details of an adequate general clinical examination, the importance of which is rightly emphasised, that "it is not possible to discuss the examination of the various joints and muscles"—which we find unfortunate. There follows a chapter on rheumatic fever, included for the sake of completeness and contrast; though there are hints of affinities between acute rheumatism and chronic arthritis, it is clinically expedient, in our present ignorance of their causes, to regard them as separate diseases. Then come descriptions of the various forms of chronic arthritis, grouped after the classification of the College committee under the two main headings of rheumatoid type and osteoarthritic type. This arrangement emphasises the similarity of some forms of gonococcal with "rheumatoid" arthritis, and the need for thorough search for a gonococcal focus, which the author holds is often missed. Of dental foci Dr. Bach is frankly sceptical; "the majority of so-called infective teeth, as judged by the radiologist," he writes, "are not the causative agent in rheumatic diseases." The varieties of spondylitis, and the associations between joint disease, disordered metabolism, and the ductless glands, are discussed separately, and there is an interesting, if somewhat speculative, section on muscular rheumatism and fibrositis. The last quarter of the book is a full and moderately critical account of treatment.

Illustrations are few, and some of them are familiar; many more specimens and some sections illustrating morbid anatomy would have been welcome. The style is clear and easy, though in places rather loose, and a few inaccuracies (such as the repeated measurement of phosphatase in milligrammes) have crept in. The great merit of the book is that, in addition to being interesting, comprehensive, and up to date, its outlook is balanced and detached. No theory of pathogenesis is urged beyond the limits to which the evidence will take it, and no treatment receives excessive commendation. It is a work of consolidation and will be valued by all who believe, with the author, that in the long run progress owes less to flashes of genius than to the accumulating results of many conscientious workers.

Essentials of Materia Medica, Pharmacology and Therapeutics

By R. H. MICKS, M.D. Dub., F.R.C.P.I., Professor of Pharmacology, Royal College of Surgeons in Ireland; Physician, Sir Patrick Dun's Hospital, Dublin. London: J. and A. Churchill Ltd. 1935. Pp. 395. 12*s.* 6*d.*

THE traditional method of writing text-books on materia medica and therapeutics is to describe the action of each drug as determined by the methods of experimental pharmacology, and then to discuss its possible therapeutic uses. The writers of such books at the beginning of this century had usually some training and experience in experimental work, but were primarily physicians, and their accounts were coloured by their clinical experience. Since that time, with the development of pharmacology as a science, text-books have been written in the main by exponents of the experimental method, who have naturally tended to emphasise this aspect of the subject. Prof. Micks writes as a clinical physician with, so he says, no personal experience of experimental pharmacology. He has measured the importance of a drug solely by its value in the treatment of disease, and has limited the scope of the book to such drugs as are administered internally and are of real value in therapeutics. The limitation is not so great as might have been anticipated by the sceptic. It is true that the author mentions only a limited number of pharmacopœial preparations, which he regards as the most active and the most important, but the reader will find an account of nearly all the drugs commonly dealt with in ordinary text-books, together with some of the more recently popular proprietary preparations. Nearly half the book is taken up with a discussion of drugs which have their main seat of action on the central and peripheral nervous system, while the others are grouped according to the particular system they are likely to affect therapeutically. In the consideration of individual drugs, the pharmacological action is, in the main, dealt with briefly and only in so far as it helps to explain the therapeutic uses.

Many readers will find the really interesting and valuable part of the book in the expression of the author's opinion on the value of a particular drug, and his advice as to how and in what conditions it should be used. He is refreshing, if perhaps at times a little dogmatic, in his statements about drugs of doubtful value. The whole is a pleasantly written account of clinical pharmacology by a physician of experience, who has reviewed his subject with judgment and balance.

Biochemical Laboratory Methods

For Students of the Biological Sciences. By CLARENCE AUSTIN MORROW, Ph.D., late Assistant Professor of Agricultural Biochemistry, University of Minnesota. Revised and rewritten by WILLIAM MARTIN SANDSTROM, Ph.D., Assistant Professor of Agricultural Biochemistry in the University. New York: John Wiley and Sons, Inc.; London: Chapman and Hall Limited. 1935. Pp. 319. 18*s.* 6*d.*

THIS is a text-book of biochemistry suitable for the student who is undertaking study in the biological sciences, such as agriculture, physiology, pathology, and so on. The first chapter gives a good series of experiments demonstrating the properties of colloids; the second is concerned with physical chemical investigations on plant saps. Other chapters deal with oxidation-reduction potential, the preparation of amino-acids, carbohydrates, enzymes, &c. The work has great value as a book of reference.

Care of the Aged, the Dying and the Dead

By ALFRED WORCESTER, M.D., Sc.D., Henry K. Oliver Professor of Hygiene, Harvard University. London: Baillière, Tindall and Cox. 1935. Pp. 77. 4*s.* 6*d.*

IN his preface the author has been at pains to justify the publication of this book; "some of the younger members of the profession," he writes, "although having enormously greater knowledge of the science of medicine, have less acquaintance than many of their elders with the art of medical practice. . . . Primarily, it depends upon devotion to the patient rather than to his disease." If this small book were put into the hands of all hospital residents and young practitioners, there might be less criticism of the overworked harassed expected-to-be-omniscient family doctor. It is a service to 'm to be reminded that successful treatment (at ny age) depends upon the coöperation of the patient as well as on scientific knowledge. The process of growing older will be accompanied in one patient by resentment and suspicion—resentment of nature's "encroachments," the first white hairs, various physical limitations. The man who, instead of happily enjoying his one round, bores his friends about his "fool of a doctor" who has knocked off his second round of golf; on the advice of valetudinarian friends, he seeks an "independent opinion" and falls an easy prey to the advertising charlatan. What a contrast to another patient who enters the stage of senescence so well described by Dr. George Draper as "the most interesting, useful, and happy. Enlarging powers of thought and opportunity for meditation offset waning capacities of bone and muscles. Creativeness in the realm of thought has often reached its highest expression at this period." Wholly rewarding are the patients of this class. Among other points emphasised by Dr. Worcester in the care of the aged are the value of occupational therapy; of "insisting upon continuance of . . . respectful treatment"; and remembering the loneliness of the old.

The section on the care of the dying is an equally humane consideration of the many ways in which a doctor can alleviate and help his moribund patients. "Whispering within their partial hearing is unpardonable." "It is his [the doctor's] function to decide when all treatment designed for restoration shall be replaced by what is more likely to comfort the patient." As to the relations, "much of the uncertainty as to what should be said or left unsaid on such occasions is owing to general ignorance of the fact that death is almost always preceded by perfect willingness to die." He quotes William Hunter's last words: "If I had strength enough to hold a pen, I would write how easy and pleasant a thing it is to die."

On the care of the dead Dr. Worcester is again firm and sound. He reminds us that often the suggestion of an autopsy is welcomed by relatives, who are probably relieved by knowing the facts as to the cause of death. He has no use for embalmers and the "mortuary artist" who complacently said: "Yes, we make a specialty of smiles." He deprecates the extortionate cost of elaborate funerals, and finally advocates cremation, which "depends upon hastening instead of retarding the natural return of the body to the dust."

Nutrition and Physical Fitness

Second edition. By L. JEAN BOGERT, Ph.D., Consultant in Nutrition, Delineator Institute, New York. London: W. B. Saunders Co., Ltd. 1935. Pp. 566. 13*s.*

THIS is a condensed treatise on the subject of nutrition based on writings and researches of many workers, whose findings the author has sifted and correlated. Considerable care and judgment have been exercised in the arrangement of the subject matter, which includes sections dealing with the metabolism of foodstuffs and the requirements of the body, the relationship of nutrition to intimate physiological processes, the planning of diets, the construction of menus, the feeding of children, pregnant and nursing mothers, and the special problems of diet which arise in disease. It should prove a useful book to students of dietetics.

Introduction to Comparative Zoology

By F. G. S. WHITFIELD, F.R.E.S., F.R.M.S., Entomologist to the Sudan Government; and A. H. WOOD, M.A., Entomologist to the Gezira Agricultural Research Service, Sudan Government. London: J. and A. Churchill Ltd. 1935. Pp. 354. 15*s.*

THIS is an admirable introduction to comparative anatomy suitable for medical and science students. The relationships between the types described are continually stressed in an interesting manner, and the diagrams are with a few exceptions good and mostly original. Since it is intended as a general introduction to zoology it is, however, to be regretted that the main section of the book deals exclusively with pure morphology; the physiological aspect is given little space and is isolated from the rest in a manner which is not likely to impress the student that form and function are in reality inseparable. No suggestion is made that students should perform elementary physiological experiments. But within the limits which the authors have set themselves the book is strongly to be recommended. Besides providing for the needs of the average student, it is written in such a manner as to encourage a deeper interest in the subject. Suggestions for further reading are also given.

THE LANCET

LONDON: SATURDAY, AUGUST 24, 1935

FIFTY-TWO YEARS LATER

On September 4th, Sir Thomas Barlow completes his ninetieth year, and to commemorate this event the *Archives of Disease in Childhood* for August are devoted to various aspects of infantile scurvy, the disease with which his name is most closely linked. British pædiatrics does itself and Sir Thomas great honour in the production of this "birthday number," for it enables physicians and investigators from England, America, Norway, and France to display something of the vast territory his work has opened up. And it is no disparagement of the contributions offered by his successors to say that Barlow's original paper, reproduced from the *Medico-Chirurgical Transactions* of 52 years ago, outshines them all. Of the 31 cases which form its basis 11 had been under his own care, and in reading the graphic clinical description it is easy to picture the child smitten with scurvy—and possible even perhaps to catch a faint North Country intonation in the writer. Previously Cheadle had recognised scurvy supervening on rickets and had realised that the disease was due to defective diet: "the essential factor, it has been proved over and over again, is," he wrote, "the absence of certain elements in the food."[1] But to Barlow we owe the demonstration that there is no such thing as "scurvy rickets"; that the disease is true scurvy occurring in infants; and that any rickets present is wholly independent, as Glisson had declared as long ago as 1650.

Barlow's clear conclusions made it easy to recognise and cure infantile scurvy, and as direct and indirect result of his work the disease has changed, and is changing, its character. In the first place it is now so rare that in the largest children's hospital in England only 9 cases have been seen in the last three years. Secondly, those children who develop it do so at an earlier age; for two decades, Dr. Still[2] says, it has been seldom encountered at ages above a year. This state of affairs he attributes to earlier diagnosis; but there are other factors also which have tended to lower both incidence and age of onset, and these relate to changes in feeding. In the days when Barlow wrote his papers the favourite diets for infants artificially fed were made up either from condensed milk or from proprietary foods; nowadays these have been largely supplanted by dried or pasteurised milk, in which vitamin C stands a better chance of survival. Even more important, however, is the conversion of the lay public to the belief that orange juice is necessary for a child's well-being—an advance in infant dietetics for which pædiatricians, infant welfare centres, and the Empire Marketing Board may all claim credit. For evidence that Great Britain has become "orange-minded" we need go no further than the fact that the consumption of this fruit last year was 29½ lb. per head of population. If asked why scurvy was not more common among the poor before the vogue of oranges we must refer, like Barlow, to the opinion of Cheadle. The children, said the latter, "soon begin to feed with their parents, and potatoes and gravy are almost invariably given them. This does not prevent them becoming rickety, but it seems to keep off scurvy; potatoes, as the late Dr. Baly proved, being an excellent antiscorbutic."[1] In 1878, it will be seen, there was already a great accumulation of practical knowledge of the disease; and the information provided by Prof. J. C. Drummond, on p. 459 of our present issue enables us to pay tribute to one of many—generally unknown—who made great sacrifices to gain such knowledge for us.

If frank infantile scurvy is nowadays a rarity, can we assume that, so far as antiscorbutic elements are concerned, the national infantile dietary is now perfect? Or has the clinical picture of scurvy been so far modified that it is not recognised? Work in progress is providing answers to these questions. The supposed existence of a latent scurvy has been derided by some clinicians, yet Barlow himself said that minor degrees are probably "not so rare as might be thought." Dr. E. A. Park and his associates, in a valuable communication[2] from Johns Hopkins Hospital, report that the time which frank scurvy took to develop in 37 infants was from two to nine months, which is longer than it takes in the adult—probably because traces of vitamin C usually remain in the pasteurised milk which most babies get. They were unable, however, either to detect any prodromal symptoms that would have made it possible to diagnose latent scurvy, or to discover the cause of the sudden outburst of acute symptoms. They compare this rapid onset to the sudden manifestation of acute tetany in a case of latent tetany, and the comparison is an apt one, since the existence of latent tetany is undoubted, and its sudden activation often seems to be attributable to infection, which is a factor that might equally determine the onset of acute scurvy. The presence of latent tetany can be shown by biochemical methods, and now that vitamin C has been isolated a biochemical test for latent scurvy has been elaborated by L. J. Harris and S. N. Ray.[3] As related by Mr. S. S. Zilva, D.Sc., whose fascinating story[2] should be read in full, it has been shown that the properties of vitamin C are possessed in full measure by *l*-ascorbic acid (known in the United States, perhaps unfortunately, as cevitamic acid). Applying the 2 : 6 dichloroindophenol test for this substance, HARRIS and RAY find that the normal child, being saturated with vitamin C, passes a fairly constant amount (0·03 mg. per c.cm.) in the urine. If a dose is given by mouth to a normal child, urinary excretion of the acid immediately increases; but in children suffering from scurvy the amount excreted is unusually low, and does not increase after the test dose, because the ascorbic acid is needed to make up the body's vitamin-C deficiency. From this it is deduced that if any child does not show a rise in excretion of ascorbic acid after a test dose it must be suffering from scurvy, latent or otherwise. Here then we have an excellent means of detecting "subclinical" vitamin-C deficiency—provided the indophenol test is an accurate one. Unluckily it is open to criticism on the ground of non-specificity; but the same accusation cannot, it is claimed, be maintained against the modification* now employed, at HIRST's suggestion, at the Children's Hospital, Birmingham, where it is accepted as clinically satisfactory. The figures obtained there are somewhat different from those of HARRIS and RAY, but do not invalidate their thesis or detract from the medical importance of their observations.

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[1] The Lancet, 1878, ii., 685.

[2] Arch. Dis. Childhood, August, 1935.

[3] The Lancet, 1935, i., 71 and 462; see also pp. 100, 113, and 999.

The part played by ascorbic acid in metabolism has been much studied. It probably forms an oxidation-reduction system in the body and is concerned in tissue respiration. It is also one of the factors responsible for the maturation of the red cell, and Prof. L. G. PARSONS and Dr. W. C. SMALLWOOD[2] now offer evidence that it operates throughout the maturation of the red cell, from the reticulo-endothelial system to the erythrocyte, and not only, as usually stated, from normoblast to erythrocyte. Anæmia is not always to be found in scurvy, whether latent or acute, but it is nevertheless a specific symptom of the disease; it is usually normocytic and orthochromic but may be macrocytic. Suggestions have also been made that vitamin-C deficiency may be wholly or partly responsible for conditions other than scurvy, such as Addison's disease, acute rheumatism, pyorrhœa, and some forms of purpura. So far, however, there is no real evidence in favour of these possibilities, and in the case of rheumatism Prof. BRUCE PERRY presents evidence to the contrary in our present issue. The current opinion is that the vitamin is not stored in the body, and Dr. K. U. TOVERUD[2] finds that the amount contained in the liver of new-born Norwegian infants is small. But some animals are able to synthesise it themselves, and the idea is put forward by Prof. P. ROHMER and Dr. BEZSSONOFF[2] that the human infant likewise is able to do this during the first year of life; "the infant," they think, "does not become scorbutic because his food is lacking in vitamin C, but because the inherent function controlling the synthesis of this vitamin has become feeble or has disappeared." This view does not accord with clinical experience, and would require more proof before it could be accepted.

The question may be asked whether there are any clinical symptoms which, in association with HARRIS and RAY's test, can be held to make up a clinical picture of latent scurvy. It must be confessed that any such picture is very hazy. We owe the conception of latent scurvy largely to the late ALFRED HESS[4] who pointed out that suspicion should be awakened if in the absence of other causes a child fed on pasteurised milk lost its appetite, ceased to thrive and gain weight, showed increased knee-jerks, and perhaps had a rapid pulse and respiration. ROHMER and BEZSSONOFF describe prescorbutic dystrophy as characterised by pallor, anorexia, change in character, and a slowing of the increase in weight and also rarely of length; sometimes there is disturbance of digestion, sometimes an anæmia responding only to a combination of vitamin C and iron, and sometimes again a persistent pyrexia probably due to recurring infections. On the other hand, we have already commented on the inability of PARK and his colleagues, who looked out for all these features, to find any characteristic prodromal symptoms. The fact that the clinical picture is indefinite makes all the more valuable the means now at our disposal for estimating the urinary output of ascorbic acid and so establishing the existence of deficiency. The only other way of proving latent scurvy is to see whether it disappears when the patient is given vitamin C.

It has been the rare privilege of Sir THOMAS BARLOW that he has been able to witness, as a consequence of his work, the complete conquest of the acute manifestation of the disease which he described, and the abolition, not only of death from this cause but also of the intense suffering which preceded it. Moreover, he has seen a significant change in the character of the disease and the birth of a sure and certain hope that infantile scurvy even in its latent form will soon belong only to the past. Such a reward is vouchsafed to few men, and of Sir THOMAS BARLOW it may be said that none has deserved it more.

KYMOGRAPHY AND THE SURGERY OF PHTHISIS

FOR some years now kymography has been applied with interesting results to X ray examination of the chest. Its application in cardiology has recently been discussed in our columns.[5] A useful illustrated description of the method was recently given[6] by Dr. H. H. WEBER, working in the first medical clinic of the Berlin Charité. The method consists in taking an X ray photograph through the slits of a lead screen placed between the film and the patient. The slits are 12 mm. apart and 0·5 mm. across, and during the exposure the screen is moved a distance of 12 mm. at right-angles to the slits so that the picture which would at first consist of a series of lines gradually becomes a series of strips which widen until they meet at the moment the exposure ends. It differs from cinematography in which instantaneous pictures of the whole object are taken and placed in series, for it consists in a number of moving pictures —or, rather, moving objects on a stationary background—within a single outline. As Dr. WEBER puts it, kymography makes it possible to *read* movement, whereas cinematography makes it only possible to *see* movement. The cinematographic conception of movement is a judgment based on sensations of direction and of speed; kymographic reading is pure analysis and it is possible for anyone to interpret a kymogram at any time without further help. Incidentally this method of investigating the mechanism of respiration in the living patient has confirmed views expressed by Sir ARTHUR KEITH more than 20 years ago—namely, that the ventilation of the upper lobe is maintained by movement of the upper six ribs, while ventilation of the lower lobe is effected by movement of the diaphragm and lower ribs. These movements although synchronous are independent; with a free pleural space and normal interlobar sulcus diaphragmatic movement has no effect on the upper lobe.

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* This modification is based on the fact that copper inactivates vitamin C and therefore two estimations are carried out on the same specimen of urine, one directly and the other after boiling with copper sulphate, the difference between the two figures giving the amount of ascorbic acid excreted.

[4] Scurvy, Past and Present, Philadelphia, 1920.

[5] THE LANCET, 1935, i., 221.

[6] Beitr. z. Klin. d. Tuberk., 1934, lxxxiv., 99.

There are certain practical applications of this knowledge, pointed out by Prof. E. SCHNEIDER, of Freiburg i. B., in an exhaustive paper.[7] It has, for instance, been found possible to exclude both upper lobes from active respiration by excision of the upper ribs on each side, and for respiration to be maintained by the two lower lobes ventilated by means of the diaphragm and the lower ribs. For long there has been dispute over the value of inducing paralysis of the diaphragm for an isolated lesion of the upper lobe; it is now clear that paralysis of the diaphragm can only affect the upper lobe if adhesions have formed in the interlobar sulcus. Kymography may make it possible to select with accuracy the cases suitable for phrenicectomy. For the induction of an artificial pneumothorax repeated punctures may be made in the attempt to find a free pleural space; the radiogram gives no help in selecting the best point for puncture. Kymography can give the required information and spare the patient needless discomfort; it may indeed make induction possible when the attempt would otherwise have been abandoned. All extensive operations on the chest wall are accompanied by the danger of mediastinal flutter, and before undertaking them it is important to know if the mediastinum is normally mobile; the radiogram may show gross deviation of the trachea, but kymography can give exact information. SCHNEIDER emphasises the modern view that collapse operations are designed to permit retraction of the diseased lung and so allow the natural healing tendency to attain its objective. A proper understanding of the mechanics of respiration enables this result to be attained without violating physiological principles and so the patient may be protected from post-operative complications. With a free pleural space an artificial pneumothorax should suffice to control the disease. When collapse of the diseased portion of lung is impeded by adhesions to the chest wall they should be divided through the endoscope. Attempts to stretch adhesions by increasing the gas pressure or prolonged trial of an incomplete pneumothorax no longer form part of the practice of an informed clinic. The first is responsible for infected effusions; the second may permit disease to progress to a stage at which any collapse operations would be futile.

Thoracoplasty is reserved for cases in which the pleural space is obliterated, and SCHNEIDER reviews the types of operation in use. The original Brauer-Friedrich method in which eleven ribs were removed in their entirety imposes so great a strain on the vascular and respiratory systems as to have led to its abandonment in the treatment of phthisis. Its successor, the Brauer subscapular thoracoplasty, in which the front portions of the ribs are left is also regarded by SCHNEIDER as unnecessarily severe. The operation of choice is the Sauerbruch paravertebral method in which ribs one to eleven are excised, each for a distance of 2–3 in. from the costotransverse articulation, danger of aspiration pneumonia being avoided by dividing the operation into two stages beginning with ribs six to eleven. This reduces the capacity of the operated side by 600 to 900 c.cm. some six to nine months after operation. In very ill patients the operation may be divided into three or more stages. Should a large cavity remain, as happens occasionally, a paraffin "plombe" may be inserted later. SCHNEIDER believes that there are cases of diffuse upper lobe disease in which the arrow resection of Wilms may be of service; in this a paravertebral resection of ribs one to eight is supplemented later by parasternal section of the costal cartilages. The new Italian operation of Monaldi in which phrenicectomy and excision of the first rib are combined with resection of antero-lateral segments of the second to seventh ribs appears to SCHNEIDER to be very limited in application. The Graf method of localised collapse of the upper lobe is attended with the danger of aspiration pneumonia. SCHNEIDER accordingly does the operation in two stages, in the first of which the three upper ribs are exposed from in front and the anterior portions excised from the costo-chondral junction to the mid-axillary line. And he does not follow Graf in stripping the diseased lung from the parietes. Phrenicectomy he regards as useful in exudative disease limited to one lung, in lesions of the lower or middle lobes, and as an accessory to Graf thoracoplasty when there is fibrosis in the interlobar sulcus. He is as modest in his claims for phrenicectomy as an adjuvant to other operations as is Mr. MORRISTON DAVIES in his article on p. 418 of this issue. There are certain cases, Mr. DAVIES thinks, in which it is advisable to paralyse the dome of the diaphragm some time before operation, in order to improve the patient's general health. But he would then only crush the phrenic nerve and allow it to recover again.

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[7] Med. Klin., June 7th, 1935, p. 737.

SCHNEIDER concludes his survey by expressing regret that the selective nature of modern operation for phthisis is still not generally appreciated and that many patients who might be healed by surgical intervention are restrained by the mistaken belief that thoracoplasty is always a severe and deforming operation. This was true of the original method, but is no longer true, while kymography is likely to help still further in the selection of an operation appropriate for the individual.

TRACHOMA

THE last five years' research on trachoma is described by Dr. M. D. MACKENZIE in a report issued by the Health Section of the League of Nations.[1] The information has been accumulated from various countries in Europe, Asia, Africa, and America, and Dr. MACKENZIE points out that the first difficulty that confronts the statistician is that the disease is insufficiently defined. A specially trained ophthalmologist is needed for its diagnosis in doubtful cases, and we cannot fairly judge of its incidence in a whole country on a basis of figures from selected areas. Moreover, cases of undoubted trachoma without any secondary infection, although necessarily very chronic, may run a comparatively mild course, reaching a stage of permanent slight scarring without any loss of vision. Even in Egypt, one of the most heavily infected countries in the world, A. F. MACCALLAN has demonstrated the importance of the large number of cases in which natural cure has occurred, and in China, according to A. PILLAT, the disease appears to be of a modified type, a large proportion of the patients being cured spontaneously. As to ætiology, it is universally admitted that the disease is only rampant among a poor and ignorant population, but it has been proved to be contagious in the acute stage. (Compare the story of the child at Swanley who was about to be discharged after a mild attack of blepharitis, but, not wishing to go home to a slum life in East London, deliberately infected her eyes with discharge from those of a child under treatment for acute trachoma—thus securing another year before she could be sent away.[2]) In heavily infected countries, apparently, infection almost always takes place in infancy in the home before school age and not at school. Thus in certain schools in South Tunisia, including 5000 trachomatous children, several hundred healthy French children were found who had remained uninfected during their school life in classes composed of 60–80 per cent. of trachomatous coevals. This seems surprising but other reports are consistent with it.

About the causative agent very little is really known, despite much pathological investigation. Possibly the Prowazek-Halberstaedter inclusion bodies bear some causal relation to the disease, but their presence is by no means constant. Similarly, the *Bacillus granulosis* of Noguchi is not now considered to be responsible, and NOGUCHI's positive results from the inoculation of monkeys are no longer held to be convincing, since monkeys are found to get a spontaneous follicular conjunctivitis which is liable to be confused with trachoma. Human inoculation experiments with *B. granulosis* appear, moreover, to have been negative. Thus so far as a bacteriological cause of trachoma is concerned, we are still uncertain whether this is a visible bacterium or a filtrable virus. But there seems to be more and more evidence in favour of the latter view.

Little new can be said about treatment, for the work of the last five years makes it clear that no really satisfactory remedies are yet available. For routine purpose copper sulphate and silver nitrate remain the favourites, but as alternatives or adjuvants various workers in different countries advocate chaulmoogra oil, mercuric chloride 1 in 1000 applied to each follicle after expression of its contents, and carbon dioxide snow, and during the last few years the value of diathermy has been especially urged in France. This last seems to be an excellent means of treating mild cases, and good in moderately severe ones, but it is quite insufficient when the disease is well advanced. The most important problem, however, is, afte all, that of prophylaxis. As already noted, it agreed that trachoma is, for all practical purpo limited throughout the world to poor and igno populations, with their accompanying evil overcrowding and dirt. Legislation for the pulsory notification of the disease has pr itself, in France, to be of little or no value. the heavily infected countries where inf almost always occurs during early infancy an at school, the four lines on which preve and treatment can be most usefully carrie are: (1) the provision of adequate staff pro trained for trachoma work; (2) work amo mothers and infants; (3) work in the schoo and (4) general propaganda. According to MA CALLAN two years' special ophthalmic work und the supervision of a highly qualified surgeon necessary before a graduate can take charge of trachoma clinic. On the other hand, a month training is sufficient to enable practitioners t treat cases of trachoma with drugs, apart fro operative procedures. The instruction of futu mothers, when girls at school, appears to be t only hopeful possibility of limiting the infectio of infants. If the mother has an infective stag of trachoma herself and takes no special precautions she is destined inevitably to infect her newly born child with trachoma during the first year or two of life. As to work in the schools, a distinction must be drawn between those countries where trachoma is general and those where it is only exceptional. In the former a policy of segregation is quite impracticable, but the teaching of ocular hygiene and simple treatment with drops and the like may be carried out. In the latter segregation may be highly successful. For instance, in the middle of the nineteenth century trachoma was rife in certain of the poor-law schools of London, but it has since become a rarity in this country.

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[1] Epidemiological Report, April to June, 1935. Geneva. 2s. 6d.

[2] Harman, N. B.: Brit. Med. Jour., 1930, ii., 457.

ANNOTATIONS

IMPROVING THE MINER'S LOT

ONLY a few years ago if one talked to a miner's wife about pit-head baths her comment as likely as not would be: "What do we want them for? Let my man come home and I'll get the muck off him." To-day it is said that where the new housing estates are attached to pits the women-folk will not allow the men to "mess up my clean bathroom"; they are bidden leave their dirt where they got it. Among the causes of this change in opinion and outlook is the work of the Miners' Welfare Fund, and this work ought to be much better known. Conditions in many mining villages are a heavy burden on the national conscience, and the Fund is doing what it can to secure the health and happiness of a large section of the population, whose lives are all too often spent in circumstances of danger and depression. Originally instituted in 1920 from a levy of 1*d.* a ton on every ton of coal produced, the Fund was augmented in 1926 by a levy of 5 per cent. on mining royalties. The latest report of the responsible committee[1] shows that the output levy was reduced last year to ½*d.* a ton, but the estimated receipts now amount to £600,000 per annum, and the total obtained since 1920 is over £14,000,000. The diverse activities of the Fund are indicated by the headings Recreation, Pithead Baths, Health, Education, Research. Direct health expenditure is shown as follows:—

	Total to end of 1934.		1934 only
	£		£
Convalescent homes and funds	2,593,686	....	73,106
Hospitals	379,564	....	5,598
Ambulance services ..	120,927	....	4,257
Special medical treatment and appliances	86,519	....	707
Nursing services	65,558	....	5,150

The largest item is in respect of convalescent homes, and these have been established at, amongst other places, Blackpool, Ulverston, Skegness, Scalby, Cromer, Troon. It needs no imagination to realise the boon after illness of such transition from a pit village, especially as the amenities are sometimes extended to women and children as well as men. Hospitals which serve mining communities have materially benefited by grants towards extensions or special equipment, such as X ray plant, while grants have also been made to ambulance and nursing services. Up to the end of last year the total thus allocated was over 3¼ million pounds.

Of services operating indirectly on health, the provision of pithead baths takes precedence. There are now 186 installations of these, catering for 28 per cent. of the men employed in the industry, and the number is steadily rising. There are facilities not only for bathing but also for drying pit garments, while first-aid rooms and often a canteen are also available. This is a revolution in the life of the miner and his household. To leave behind the grime of the pit, to leave behind in a drying chamber sodden working attire, to travel home and arrive home unstamped of all the marks of the nether regions, must involve a heightening of self-respect and must have a beneficent effect on health. That the facilities are appreciated is shown by the fact that the percentage of users where provision has been made is 87, though a weekly contribution is required, usually of 3*d.* to 6*d.* Not less important is the saving of drudgery and expense to the miner's wife. It has been well said that she may have a 24-hour day with men working two, or perhaps three, shifts and children returning from school. The help given her by pithead baths can only be realised by those who have seen a burly, begrimed miner sitting in a small bath in the only living room of a small cottage, or have seen on the clothes-line recently removed pit garments frozen stiff.

Of similar value are the grants made for recreation, involving up to the end of 1934 a total of nearly 5 million pounds. From this source are provided institutes and halls, recreation grounds, and boys' clubs and camps; children are especially catered for. All these provisions are of inestimable value in amelioration of what has been too long regarded as the inevitably drab environment of the industry. Education has been assisted to the extent of over a million pounds, mainly by the provision and equipment of buildings for mining instruction, and by scholarship assistance to the children of miners. A further valuable item is the making of grants to the Safety in Mines Research Board. To turn back from this report to pages which reveal earlier conditions in the industry—e.g., the report of the Children's Employment Commission in 1842—is to gain a heartening sense of the progress which has been made towards social feeling and understanding. It affords some relief from contemplation of the unhappy conditions which still cast a blight over the coalfields.

PLANTAR WARTS

A SMALL epidemic of plantar warts is mentioned by Dr. G. Chaikin, a divisional medical officer of the L.C.C., in the Council's Report for 1934 (vol. iii., part 2). There were 16 cases, all in girls, and the diagnosis was confirmed in each case by Dr. G. W. Bamber. Although more common in girls, this infection does not spare boys and has occasionally wrecked the chances of junior laurels in the football and cricket fields. In adults the condition is rare, although occasional cases are seen in women above the age of puberty. The relative delicacy of the epidermis in women and children may account for their greater proclivity to the disease. Some patients give a history of injury, as by a thorn or splinter, but the majority are not conscious of any such cause and it would seem that the virus—now generally accepted as filter-passing—can enter the epidermis without breach of the surface. Once established the plantar wart, unlike its fellows on the upper extremity, does not heal of itself. How long it may persist is unknown, for the associated pain and disability demand relief, and treatment by suggestion, occasionally successful in other localisations, appears to fail in this. Epidemics of the infection prove its contagious character, but they are rare, and might not be difficult to prevent. A weekly inspection by a nurse (or even the bath attendant) of the soles of all the children who use a public swimming bath or pool regularly would certainly be a more effective prophylactic than the application of antiseptics to bath-mats and wooden grids. It is next to impossible to prohibit a child in a swimming suit from running about barefoot and what is to prevent others from treading in his footsteps? The segregation of an infected child from a bath until cured would be unpopular but salutary. By far the most handy instrument of treatment is the X ray tube, but it has grave risks unless used with the greatest care. The L.C.C. report states that in every case a dose of a pastille and a half was given, and a second dose after the lapse of a month if the first was not sufficient; but no word is said about the risk of giving three times the normal skin-tolerance dose within 28 days. Many dermatologists will have seen X ray ulcers develop months or years after an application. For a banal affection like a wart, in which there are so many other curative means to hand, it would seem unnecessary to take any such risk.

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[1] Miners' Welfare Fund, Thirteenth Annual Report of the Miners' Welfare Committee for the year 1934. H.M. Stationery Office. Pp. 54. 1s. 6*d.*

NINTH INTERNATIONAL DERMATOLOGICAL CONGRESS: BUDAPEST

THIS Congress will be held in Budapest between Sept. 13th and 21st, 1935, as announced in these columns earlier in the year. The president of the congress is Louis Nékám, professor of dermatology in Budapest University. Nékám is a remarkable man, as will be gathered from the following note from a medical correspondent and friend. "Nékám," he says, "as well as physician and specialist, is a linguist, classical scholar, and artist. He takes a special pride in his descent from an Englishman, Alexander Neckam (1157–1217), and has always had an especial affection for the English. I met him for the first time during the International Dermatological Congress in Paris in 1900, and have enjoyed his friendship ever since. He has visited England in the interval and I have been his guest in Budapest and seen him in his wonderful clinic. This was in 1913 and at that time he was going to send his two sons to English public schools, but the war frustrated this intention. Nékám was sentenced to death immediately after the war, during the Bela Kun despotism, but the Rumanians relieved Budapest from Bela Kun before the edict could be carried out, and Nékám was able to continue his career and filled the high office of Rector of his university two or three years ago. A delightful feature of the approaching congress has been the communications from Nékám in classical Latin, and the announcement of the themes for discussions in the same language."

Many governments and important universities are ending official representatives to the congress, which will have the complete political patronage of Hungary. The Hungarian railways are giving a rebate of 50 per cent. to the members, while the Hungarian Foreign Office will grant them free visas. German, Belgian, Dutch, Austrian, Swiss, Italian, Czechoslovakian, and French railways are also granting substantial rebates on their fares. The programme is comprehensive. There are six principal "commissions" or sections, each presided over by a representative of a different foreign country. Hungary chivalrously evaded the nomination of any of their own countrymen. At the first commission, presided over by the great dermatologist Dr. Jean Darier, of Paris, the establishment of an international permanent Dermatological Association will be debated; the second commission deals with the Reform of Dermatological Terminology (president, Prof. Rille of Leipzig); the third with the Modern Classification of Diseases of the Skin (president, Prof. Howard Fox of New York); the fourth with the Teaching of Dermatology (president, Prof. Gougerot of Paris); the fifth with the Organisation of a Central Exchange for Dermatological and Venereal Exhibits and Data (president, Prof. Tommasi of Palermo); and the sixth with the Practice of Dermatology and Venereal Disease (president, Sir Ernest Graham-Little). Three conferences have been arranged dealing with dermatological disease in connexion with tuberculosis, with syphilis, and with occupational diseases. Prof. Marek, of Budapest, will preside over a discussion upon comparative dermatology, while further subjects to be dealt with in session concern physiology of the skin and the relations to internal organs, allergy in dermatology and syphilis, and dermatological disease due to filtrable viruses. A large number of individual communications are also announced.

The programme of social entertainment includes a reception by the Regent, Nicholas Horthy de Nagybanya. The British secretary is Dr. A. M. H. Gray, 69, Harley-street, London, to whom inquiries should be addressed. The accepted languages of the congress are English, French, German, and Italian, and the subscription for full membership, open to any medical practitioner, is £2 8*s*. English money.

RELIEF OF ANIMAL SUFFERING

THE last issue of the quarterly journal of the Research Defence Society contains a valuable little article with this title communicated by Sir Frederick Hobday. The essay is made up of the ninth Stephen Paget memorial lecture which was delivered at the last annual general meeting of the Research Defence Society, and it is interesting to learn from its preface that the work and interest taken by the Research Defence Society in certain testamentary dispositions ensured a sum of £25,000 accruing to the Royal Veterinary College. Of the many interesting subjects touched on by Sir Frederick, probably his description of the electric killer attracted the most attention. With this instrument, after it has been plugged in at some source of electrical supply, the animal is just touched on the side of the head and death ensues. All the smaller food animals in England are killed by it now we learn, and, although as yet in the case of sheep the process is permissive and not compulsory, some 690 county councils have agreed to alter in the regulations the word "may" into the word "shall," so that there will soon be no place where sheep are not killed save through the humane killer. The electrical killer can also be employed as an anæsthetic for operation, the animal receiving a current for a few seconds, which renders it apparently unconscious for about 2½ minutes. It should be mentioned, however, that there are still some who do not feel certain of the efficacy of this process, and we may recall that in our correspondence columns last December Capt. C. W. Hume expressed grave doubt about the reality of the anæsthesia and, by consequence, the humanity of the slaughter. At various points in the lecture Sir Frederick gave examples of voracity, a subject which always excites wonder and amusement, whether the odd articles swallowed illustrate the perverted taste of the human subject or of any other animal. Cows have swallowed silk stockings, and one appears to have committed suicide in the attempt to swallow a sheet. Within the stomach and intestines of horses there have been found stones, nails, piping, and wire to an incredible extent, and dogs appear equally careless of consequence when indulging in odd diets. The adventurous surgery of the modern veterinary expert has obviously many opportunities, and its description formed the more exciting features of Sir Frederick's address, but he prefaced his words with remarks of the greatest political significance, and it is to be hoped that they also received attention. Agriculture he described as the backbone of civilisation, and the wealth of a country depends upon its animals. He said that in this country there are 930,000 horses, six and a half million cattle, seventeen and a half million sheep, two million pigs, and three million dogs—he gave no census of cats or poultry. With the better day that is promised for British agriculture it is well to know that the aggregate value at the present moment of farm animals in Great Britain is over one hundred and fifty millions, and that we produce some sixty million pounds worth of milk annually. The prevention of disease among our stock is therefore a matter of the greatest financial importance and a more generous endowment of the veterinary profession is definitely indicated. Preventive medicine among animals is in a favourable position in a country which is surrounded by water; eradication of disease becomes a possibility, so that a return is certain for any efforts spent.

A PUZZLE IN THE ÆTIOLOGY OF CANCER

A STRIKING example of the familial incidence of cancer is reported from Georgia by C. W. and C. P. Roberts.[1] The family comprised five girls and two boys, and within a few months of one another one of the boys, aged 23, and two of the sisters, aged respectively 17 and 13, developed bone sarcomata. The months when they came under observation were August, 1933, January, 1934, and February, 1934, respectively. The disease took a rapid course and they died in May, 1934, July, 1934, and January, 1935. In each case the seat of the disease was a long bone of the same side—the right one—namely, the tibia, femur, and humerus. Histologically the growth was in two cases a round-celled osteogenic sarcoma, in the third case a fibrosarcoma. There is no history of cancer in the family and the other sisters, aged 21, 19, and 10, and the youngest brother, aged 6, are alive and well. This group of cases would furnish a good subject for a discussion among adherents of the two opposed theories concerning the origin of cancer. Those who hold the view that genetic factors are of paramount importance will accept them as supporting their view. Adherents of the virus theory will point out that the simultaneous occurrence in three people of varying age, living in close contact with one another, suggests an extraneous agent rather than genetic factors. The authors of the report take an intermediate position postulating some extraneous factors, not necessarily of an infective nature, acting on persons whose osseous system was genetically susceptible to the development of malignancy.

TSETSE-FLY CONTROL

THE report of the East Africa Sub-committee of the Tsetse-fly Committee (Cmd. 4951, H.M. Stationery Office; 1s.) brings to a focus the many facets which go to make up the sleeping sickness problem, and shows very clearly how essential it is that this problem should be attacked from all angles if successful control is ever to be achieved. The three main methods of approach are by (1) administrative measures: the movement of populations, the evacuation of certain selected areas and the closer settlement of others, measures which demand a thorough and sympathetic understanding of local conditions; (2) the eradication of the tsetse-fly; and (3) the use of drugs. It is a curious and unforeseen result of the *pax Britannica* that as the native African, in Northern Nigeria, in Nyasaland and elsewhere, has acquired a feeling of security, he should have begun to indulge to the full his propensity for establishing little family settlements in the bush—and so to have led during recent years to a great increase in sleeping sickness. Considerable success is being achieved in parts of West and East Africa in weaning him away from this habit and bringing him again into larger settlements. In the matter of tsetse-fly control, it has come to be realised that this can only be effective if it is based upon a thorough understanding of the natural history of the fly. But colonial governments are apt to want the results without the fundamental study, and it is a triumph for the Tsetse Research Department of the Tanganyika Territory that they should have persisted in making a scientific study of the habits of the fly at the same time as they devised their methods of control. The results have been promising, and the department is congratulated by the subcommittee. The same realisation of the necessity for fundamental research is shown by the subcommittee in the recommendations for the continued study of the behaviour and relationships of trypanosomes, the action of trypanocidal drugs, and the pathology of sleeping sickness.

ARTIFICIAL RESPIRATION: THE HOLGER NIELSEN METHOD

IN a recent leading article (July 20th) the claims were discussed of various manual methods of artificial respiration. Col. Holger Nielsen who is sports inspector at Gjentofte, a seaside suburb of Copenhagen, has evolved[1] a method which has now been adopted by the Danish Red Cross Society and the Danish Life Saving Association. He has found that whereas Schäfer's method can start automatic respiration more rapidly than Silvester's, the latter method causes a greater depth of respiration. His own method combines the features of both Silvester's and Schäfer's.

> The patient is placed in the prone position with the hands folded, and forming a cushion underneath the forehead. A handkerchief is put on the ground underneath the face in order to prevent inhalation of dust. As a preliminary measure the operator slaps the patient's back two or three times to make the mouth open and the tongue fall forward. He then kneels on one knee in front of and facing the patient's head, placing his hands on the scapulæ. He now exerts pressure for 2½ seconds on the chest by swaying gently forward on his outstretched arms. Then he relaxes and sways backwards, at the same time allowing his hands to slip back over the patient's shoulders and to grasp the arms midway between the axilla and the elbow. The patient is then partially lifted by the arms for 2½ seconds. The double movement is done in about 7 seconds or 8 or 9 times in a minute. If signs of returning life are seen the "lifting" movement is discontinued, and only the rhythmical pressure on the chest is carried out until automatic respiration is firmly established. It is thought that there might be over-ventilation of the lungs when the lifting movement is carried past this point, leading to a diminished concentration of CO_2 in the blood.

It seems that Prof. A. Krogh has tested the method exhaustively and has been able to give it unqualified endorsement.[2] He finds that the simple shoulder pressure alone, without the "lift" of the arms, is 10 per cent. more efficient than the rib pressure of Schäfer's method. On the other hand C. Sillevaerts says[3] that the Holger Nielsen method is more difficult to perform than those of Howard and Schäfer, but it has the advantage that the viscera and the ribs are unlikely to be injured because the pressure is applied to a strong area of the thoracic wall. Before the method is adopted widely it will doubtless require further experimental and practical tests. But these tests should be made.

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[1] Jour. Amer. Med. Assoc., July 20th, 1935, p. 181.

[1] Lindhard, J.: Ugeskr. f. laeger, 1934, xcvi., 67.
[2] Münch. med. Woch., April 18th, 1935, p. 326; and Power and Works Engineer, July, 1935, p. 254–56.
[3] Bruxelles Méd., Dec. 2nd, 1934, p. 135.

INGLEBY

As a preface to the Ingleby lectures for 1935, which appear at the front of our issue, Dr. K. D. Wilkinson gave some account of the man in whose memory the lectureship was founded. John Tomlinson Ingleby was born in Cheadle in Staffordshire on March 7th, 1794. He served five years' apprenticeship to a Mr. Bourne, a surgeon in Cheadle, and then, after working in London and Edinburgh, he obtained the diploma of member of the College of Surgeons of England in 1816, and immediately came to Birmingham where he was appointed surgeon to the dispensary, a post he retained until 1840. He soon established a reputation in the town as a sound practitioner, so that when in 1828 Mr. Sands Cox sought teachers for the recently established medical school, Mr. Ingleby was appointed lecturer in midwifery. At first he lectured at No. 24, Temple-row, but the school was soon moved to more commodious quarters in Snow Hill (a site obliterated later by the construction of the Great Western railway station), and in 1834 a second move occurred to a building bought by Mr. Cox in Paradise-street, the number of students having risen to ninety. Up to this year each lecturer although himself unpaid had to pay a proportion of the expenses—rent, rates, &c.—of the school. By 1838 the course in midwifery had been much extended, some sixty lectures being given in the spring term on five mornings a week at 7.45 A.M., and in 1839 Dr. Berry became associate lecturer. From the date of his appointment as lecturer in midwifery Ingleby devoted himself to the special study of obstetrics, and established himself as the first obstetric specialist in Birmingham. His European reputation followed publication of a book on Uterine Hæmorrhage in 1832, and a second on Facts and Cases in Obstetric Medicine in 1837. These works gained him election as M.D. Heidelberg and fellow of the Royal College of Surgeons of Edinburgh—the first in Birmingham. Both books are written in clear concise English, which was as unusual at that date as it is now. Ingleby recommended the use of ergot of rye to assist uterine contraction, and transfusion of blood as a useful and life-saving measure when blood loss has been severe. A transfusion syringe, he wrote, should be in the possession of every person practising midwifery. Dr. Wilkinson describes Mr. Ingleby as a spare man, of medium height, with dark grey hair, and a rather peculiar awkward swinging gait. He was restless, excitable, nervous, and perhaps a bit hypochondriacal. His appetite and sleep were always spoiled by a worrying case, but it is recorded that he was never known to be angry, and that "he was a remarkable exception to the mass of our profession in the fact that he was never heard to speak with discourtesy or disparagement of a fellow practitioner."

THE FIRST CHANNEL-SWIMMER

SIXTY years ago, on August 25th, 1875, Captain Webb swam from Dover to Calais in 21 hours 45 minutes. On July 3rd he had swum from Blackwall Pier to Gravesend, a distance of 20 miles, in 4 hours and 45 minutes. In commenting on these feats THE LANCET pointed out there were still a few people alive who could remember when Byron swam the Hellespont and suggested that such natatory enterprises might well become common. It was not until 1911 however that the Channel was swum again (by T. W. Burgess), and it is notable that not until 1923 was Captain Webb's time appreciably decreased; indeed for the England to France crossing he held the record till last year, though Georges Michel swam from Gris-nez to Dover in 1926 in only 11 hours and 5 minutes.

It is difficult for us to imagine the excitement Webb's effort aroused; since the spate of the 1920's we have come to recognise Channel-swimmers as an esoteric but definite sect of the community. THE LANCET had particular reasons for interest, since the hero had a medical father and brother, and the latter, Dr. Thomas Law Webb, communicated to our columns a short account of Captain Webb's sensations immediately after his swim. On going to bed when he arrived in France he had taken his own temperature and found it to be 98° F. On waking five hours later he felt hot and feverish and found that it was 101°. He felt his pulse and thought it was "slower than usual." After a few hours' more sleep he woke up feeling quite well save for a little stiffness. Apparently he did not use goggles and had been almost blinded by the salt water. He was later examined by Mr. Henry Smith, surgeon to King's College Hospital, who refers to the *extraordinary volume of air entering his lungs at each inspiration.*[1] Webb was at this time 27 years of age; he was 5 feet 8 inches in height and weighed 14½ stone. Later he aroused some medical interest once more when a sphygmographic tracing of his pulse was published[2] as being the standard for a normal heart and arteries—a conclusion challenged in the following week by a correspondent, who described it as typical of a heart which had undergone *inordinate strain* and would in time recover.

A leading article on Sept. 26th declared that the best training for extreme exertion is sound general health, and suggested that a good deal of Webb's success was due to his not feeling the cold. His success is put down to the fact that he was a straightforward swimmer, and waste of energy in "fancy swimming" is deplored as wanton. "Plain, straight-ahead swimming with the breast-stroke," said the writer firmly, "is the one worthy enterprise."

PROGESTERONE

INTERNATIONAL standards for the sex hormones were discussed at a meeting of a section of the Permanent Health Commission of the League of Nations held in London last July with Sir Henry Dale, F.R.S., as chairman. Problems of nomenclature were raised among others, and in our correspondence columns this week will be found an announcement on the name of the corpus luteum hormone drawn up by four workers who have added much to our knowledge of this substance—Allen of Rochester, N.Y., Butenandt of Danzig, Corner of Rochester, and Slotta of Breslau.

Lord Linlithgow, who is to take up his duties as Viceroy of India next April, has been chairman of the Medical Research Council since September, 1934, when he succeeded Lord D'Abernon.

INDEX TO "THE LANCET," VOL. I., 1935

THE Index and Title-page of Vol. I., 1935, which was completed with the issue of June 29th, is now ready. A copy will be sent *gratis* to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

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[1] THE LANCET, 1875, ii., 416.

[2] Ibid., 1875, ii., 576.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXVI.—PROGNOSIS IN FRACTURES OF THE BODIES OF THE VERTEBRÆ

ALMOST all fractures of the bodies of the vertebræ are of the crush variety. These fractures are always produced by forcible flexion of the spine and are generally found where the spine is most mobile, from the 11th thoracic to the 2nd lumbar vertebræ or from the 3rd to the 6th cervical vertebræ. In most cases the injured vertebra becomes wedge-shaped, the sharp end of the wedge being anterior. This deformity is brought about in the following way: a horizontal fracture occurs, starting at the anterior border of the vertebra near its centre and extending backwards, roughly parallel to the upper surface of the bone. The upper portion is then impacted into the lower fragment. The maximum amount of impaction occurs anteriorly. The X ray appearance in a recent fracture is characteristic, and where the impaction occurs increased density of the shadow is shown. This was described by the late Dr. Stanley Melville as "sugar-loafing." Although the major deformity produced in the vertebra is one of antero-posterior wedging a certain amount of lateral wedging may also be found. In a small number of cases of crush fracture neither anterior nor lateral wedging is apparent, but instead, a depression occurs in the centre of the vertebra. This has recently been named by William Rogers of Boston "sauceriza-tion," a word which he has coined to indicate the shallow, saucer-like depression appearing in the upper surface of the bone. Occasionally a portion of the bone is separated from the body anteriorly. This injury is generally associated with a subluxation between the body of the injured vertebra and the one above. In many cases where a severe crush fracture of the body of a vertebra occurs a lesser degree of crushing is found in the neighbouring vertebræ. In all cases of fractured vertebra one or other of the intervertebral discs adjacent to the vertebra is injured. Since in these cases the fractures are produced by indirect violence it is exceptional to find any material injury to the soft parts in the neighbourhood of the fracture.

Success in treatment depends first, upon an early diagnosis, and secondly, of course, upon the type of treatment adopted. Out of a very large number of cases injured in industrial accidents and examined by me on behalf of insurance companies, in no single instance was there a record of any attempt having been made to reduce the impacted fracture. In this series of cases only 11 per cent. ultimately returned to their pre-accident work; and the average period of incapacity exceeded two years. In most of these cases the fractured vertebra had not been diagnosed and the treatment adopted was vaguely described as "rest and liniment."

Results following Disimpaction and Immobilisation

In an uncomplicated case of fracture of the body of the vertebra, treatment by disimpaction of the fracture and proper immobilisation of the spine offers an excellent chance of cure. Until recently surgeons have been afraid to attempt to reduce such fractures lest they caused irreparable injury to the spinal cord. The possibility of injury to the cord, however, if proper procedure is adopted, is remote. If a very careful stereoscopic examination of films of the spine shows that both pedicles and the articular processes of the vertebra are intact only very exceptional violence will cause a subluxation of a vertebra and consequent injury to the cord.

In such cases a rapid method of reduction of the fracture may be undertaken. There are various methods of achieving reduction, but all depend upon forcible hyper-extension of the spine relying upon the intervertebral discs and the anterior common ligament to pull out the impacted portion of the bone. When it is quite certain that there is no bone injury apart from that to the centrum, reduction may be effected under an anæsthetic. In other cases reduction should be effected without an anæsthetic, and performed gradually, careful watch being kept upon the patient both for local pain and for interference with the leg reflexes. This gradual reduction without anæsthetic may be extended over a period of about seven days, but better results are generally obtained if the whole operation is carried through in less than an hour. After reduction of the fracture the spine is immobilised while still in the hyper-extended position. The immobilisation may be effected in four different ways; (1) with the patient lying in a plaster shell, in which case an anterior shell is also made and for some part of the day the patient may be turned over, lying in the anterior shell while the back receives attention. (2) a complete plaster jacket may be applied and the patient treated in the recumbent position. (3) again a plaster jacket may be used and the patient allowed to walk. (4) a bone-grafting operation may be undertaken to secure fusion of the injured vertebra with those above and below.

However obtained, fixation of the spine must be rigidly maintained until repeated X ray examinations show complete re-organisation of the injured vertebra. The time taken to secure consolidation of the bone varies in different cases, the average being between two and eight months, although in some cases it is as long as three years. After reduction of the fracture there is no tendency to recurrence of the displacement in cases treated in the recumbent position, but in those treated by the ambulatory method in a plaster jacket a small proportion (estimated by Rogers as 13 per cent.) show recurrence of the deformity in the bone.

The fate of the intervertebral disc, however, is not as happy as that of the bone. In almost all cases it gradually gets flattened out so that the space between the injured vertebra and its neighbour becomes progressively lessened and in this way, although after the initial reduction of the fracture the contour of the spinal column is restored, when the patient gets about a very slight return of deformity consequent upon this diminution in the intervertebral space becomes apparent. With the diminution of the intervertebral space proliferation of the bone of the contiguous margins of the vertebræ usually occurs and not infrequently fusion between the vertebræ is thus obtained. This bony proliferation is frequently demonstrated in X ray films as evidence of osteoarthritis of the spine and proof of local pain. This is, of course, a mistake. It is just buttressing of the bone produced in an effort to restore mechanical stability.

The choice of treatment, whether by the recumbent or the ambulatory method, depends partly upon the site of fracture and partly upon the individual patient. Only fractures occurring where the spine is convex forwards, e.g., about the 2nd, 3rd or 4th lumbar vertebræ, should be treated by the ambulatory method. This method is definitely contra-indicated where the spine is concave forwards as in the mid-thoracic region. It is also contra-indicated in very fat patients because they are apt to lose weight in the early weeks of treatment. The plaster jacket then becomes loose and no longer gives adequate support. Ambulatory treatment, however, has the great advantage of improving the morale of the patient and in keeping up his general health and muscular tone. When firm consolidation of the bone has been obtained and the plaster jacket is removed the patient is still suffering from two conditions—extreme lordosis in the lumbar region and extreme weakness of the erector spinæ muscle. Both these conditions must be remedied before the patient is cured. It is generally necessary to fit the patient with some form of spinal brace to relieve the strain upon the erector spinæ muscle. This brace has to be worn for from one to three months whilst active treatment is adopted to improve the tone of the muscle and gradually to restore the spine to its normal contour. During this period the muscle is particularly susceptible to strain and if deformity still exists in the spine this susceptibility persists indefinitely because of the mechanical disadvantage at which different segments of the muscle act.

The period of fixation of the spine may be taken as a rough guide to the period that will be necessary to restore the tone of the back muscles and an equal period must be allowed for them to adapt themselves to the altered mechanical stresses.

Complications

Injury to the spinal cord.—This may result from direct pressure by a broken or dislocated vertebra or by a collection of blood or inflammatory exudate. Mostly the symptoms come on at the time of the accident, but where the pressure is due to inflammatory processes, or in those rare cases where it is associated with late collapse of the body of the vertebra, symptoms may start weeks or even months after the initial injury. When the onset of symptoms is immediate prognosis is bad, these cases are usually totally and permanently incapacitated unless improvement starts within a week of the accident. When the symptoms arise later, as a result of some inflammatory process; the prognosis is not so poor and complete recovery may occur in from six months to two years. The expectation of life is short, but if the patient has constant and skilled attention, it may be prolonged almost to normal limits. Without [illegible] care pressure sores soon develop. There usually also occurs a bladder infection which ascends sooner or later to the kidneys. Death results from toxæmia, from pressure sores, from uræmia due to the infection of the kidneys, or from pneumonia or bronchitis due to interference with proper expansion of the chest from paralysis of the chest muscles. In each of these cases death is a direct result of the injury.

Injury to spinal nerves.—Only in very exceptional cases is there any evidence of injury to the spinal nerves at the time of the accident or appearing subsequently during the course of treatment.

Late collapse of the vertebra (Kümmel's disease).—This condition as distinct from the recurrence of deformity in the vertebra after reduction is exceedingly rare and has only been seen in one out of more than a hundred cases examined by the writer. When it appears it should be treated as a recent fracture.

Tuberculosis of the spine.—There is a good deal of evidence to show that tuberculous disease of the spine may follow an injury. When it does so, the symptoms usually persist from the time of injury, although the disease may only become apparent either by sudden collapse of the body of a vertebra or by increasing pain. Where there are no symptoms of infection over a period of six months after the injury, it may be assumed that any subsequent development of tuberculous infection cannot be attributable to the accident described. Tuberculous disease of the spine will cause total incapacity for all forms of heavy work for a minimum of two years.

Pressure sores.—The common sites for pressure sores in fractures of the spine are over the sacrum and over the back of the heel. Large pressure sores over the back of the sacrum may leave a thin scar, which is liable to break down owing to the friction from the clothes. A collosity is often developed over the site of an old pressure sore of the heel, and occasionally this collosity renders the wearing of heavy boots difficult. It may, therefore, be responsible for some incapacity.

Thrombosis of veins.—Thrombosis of the femoral and external iliac vein is not uncommon, and usually occurs about the third week after injury, although it may come on at any time during which the patient is confined to bed.

Osteo-arthritis.—This is frequently described as a complication of fractures of the vertebræ; but arthritis of the joints between the articular processes as distinct from the buttressing which occurs on the bodies of the vertebræ is rare and seldom causes symptoms.

Neurasthenia.—This is a common complication of a fractured vertebra and is mainly due to the popular belief that a man with "a broken back" is completely and permanently crippled. In my practice the patient is not allowed to know that there is a suspected injury to the vertebræ, and probably for this reason no case in which this precaution was taken has developed neurasthenia. When the patient has neurasthenia it is difficult to persuade him to discard his spinal brace and so render his back muscles fit for the strain of heavy work. A neurasthenic patient therefore remains permanently incapacitated unless a very early settlement of any claim for damages or compensation that he may have is effected, and then in some cases there is improvement.

Summary

1. A fractured vertebra must be immobilised in plaster of Paris for from two to seven months. If the fracture occurs in a part of the spine that is convex forwards a plaster jacket may be used and the patient allowed to walk. If the fracture is elsewhere the patient must remain recumbent.

2. After removal of the spinal jacket a spinal brace must be worn for three months.

3. Exercise and massage and Faradism to the erector spinæ muscle should be persisted in for from six months to a year after the plaster support has been discarded.

4. In a successful case the patient is able to return to light work in from six months to one year after the accident and to heavy work in from one to two years after the accident. More than 60 per cent. of cases should ultimately become fit for laborious work, and of the remainder 30 per cent. should be fit for light or sedentary work, leaving less than 10 per cent. of cases totally incapacitated.

5. In cases in which the fractured vertebra has remained unreduced persistent pain is experienced, usually at a lower level than the fracture. The patient is also liable to recurrent strain of the erector spinæ muscle. Such patients only very rarely return to heavy work.

H. ERNEST GRIFFITHS, M.S., F.R.C.S.

SPECIAL ARTICLES

ALTERATION IN THE INCIDENCE OF THE GRAVIS, MITIS, AND INTERMEDIATE TYPES OF C. DIPHTHERIÆ IN MANCHESTER

AND THEIR CLINICAL CORRELATION IN A FURTHER SERIES OF 940 CASES

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Last year we published results confirming the contention of McLeod and his colleagues (1931, 1933, *a b*) that in diphtheria there is a definite correlation between the case severity of the disease and the type of infecting organism. This view is increasingly accepted and it is evident from the figures collected by McLeod (1934) that in several areas in this country the gravis and intermediate types are at present responsible for the great majority of severe toxic cases of diphtheria. The 940 cases recorded in this paper, consecutive admissions to the Monsall Fever Hospital from the Manchester area, form a second series in an investigation which has been continuous since October, 1932. The lines of inquiry have remained the same throughout.

Incidence of the Types

Table I. compares the incidence of types in the first and second series of cases. A comparison of the figures in the two series shows a very striking change in the incidence of the types. During the earlier part of the investigation the intermediate type (54·6 per cent.) was predominant in Manchester and was as lethal as the gravis. Towards the end of 1933 the number of intermediate cases gradually decreased, but there was at the same time a steady increase in the number of gravis cases, until during the latter half of 1934 the gravis type became the prevailing or epidemic strain.

Table I

Incidence of Types in the First and Second Series of Manchester Cases

—	Cases and carriers.	Gravis.	Mitis.	Intermediate.	Atypical.	Mixed.
1934	542	129 (23·8 %)	104 (19·2 %)	296 (54·6 %)	8 (1·5 %)	5 (0·9 %)
1935	940	479 (50·9 %)	261 (27·8 %)	187 (19·9 %)	1 (0·1 %)	12* (1·3 %)

* Mixed cases. 5 gravis and intermediate; 3 intermediate and mitis; 2 mitis and gravis; 1 atypical gravis and mitis 1 gravis, intermediate and mitis.

In contrast to the gravis and intermediate types the incidence of the mitis type has fluctuated only within comparatively narrow limits and has shown but a slight total rise. In order to bring out more clearly the variation in type incidence we have prepared curves which show the seasonal occurrence of the types during the years 1933 and 1934 (Figs. 1 and 2). The curves serve to emphasise both the importance of the gravis and intermediate strains as epidemic types and the endemic nature of the mitis type.

The opinion of Parish (1934) was that strains of *Corynebacterium diphtheriæ* in London were in a constant state of flux, and this condition of variability seemed to be associated with the occurrence of many atypical strains, which apparently became less numerous as the disease increased in severity. Although, as shown above, type incidence has varied considerably in Manchester, this has not led to the appearance of atypical strains. Classification was effected without difficulty and type characters have remained remarkably stable, as witness the fact that there was only one atypical strain. This confirms previous findings in regard to the stability of Manchester types (Robinson, 1934).

Clinical Features of Cases due to the Various Types

Owing to the increased prevalence of gravis strains in Manchester we have now had an opportunity of comparing out notes of a large number of severe and moderately severe infections due both to gravis and to intermediate types. We are unable to distinguish on clinical grounds alone a gravis from an intermediate infection, either at the onset or throughout the course of the illness. Both may give rise to the gravest forms of diphtheria.

We have observed a very severe mitis infection from which the patient, a boy aged 7, died on the sixteenth day of disease.

This boy was not admitted to hospital till the fifth day of his illness. By this time membrane occluded both nostrils and extending backwards covered the nasopharynx, both tonsils, and the whole of the soft palate. He had a "bull-neck" and was extremely toxic. No petechiæ were seen on admission. He was given 40,000 units of antitoxin intramuscularly and 80,000 units intravenously. Hæmorrhage occurred a few days later from the nose and throat and bruising at the site of hypodermic injections. He died eleven days after admission.

This case was indistinguishable clinically from a severe gravis or intermediate infection. Clinical differentiation is equally impossible in cases of moderate severity. It seems justifiable to say that there are no clinical criteria to enable one to distinguish a gravis from an intermediate or mitis infection, except the fact that mitis cases usually respond better to serum therapy. It may be noted that in the fatal mitis case here described, though treated late, death was definitely due to toxæmia alone. In the two cases we have reported previously (1934) toxæmia was not prominent and but for complications the patients would probably not have died. Similarly in the small series of mitis deaths described by McLeod (1934) complications were either present or treatment was received late.

Correlation of Type with Case Severity

Table II. shows the correlation of type with case severity and deaths, excluding atypical strains and mixed infections. Table III. gives the percentage incidence of deaths and complications in 809 cases (excluding carriers and infections due to atypical or mixed strains).

These results support those obtained in our earlier investigation. They show clearly the enhanced lethal power of the gravis and intermediate strains over the mitis and the much greater tendency of those strains to cause paralysis. In 1932–33 it was our experience that the intermediates were at least equal to gravis strains both in lethal power and ability to cause paralysis. During the last year the changes in incidence of the gravis and intermediate types have been reflected in an alteration of the respective case-fatality rates, the intermediate showing a marked decline and the gravis a slight rise. The intermediate type has now become not only "intermediate" as regards biological characters and incidence, but also in respect of lethal power. This is the position which obtained at Hull in 1933 (Leete et al., 1933). The Hull figures, however, were characterised by the large number of mild gravis cases (30·4 per cent.), attributed by McLeod to a partial immunity of those attacked, whereas in Manchester only 15·6 per cent. of the gravis cases were mild.

TABLE II

Correlation of Type with Case Severity and Deaths, excluding Atypical Strains and Mixed Infections

Cases and carriers.	Hæmorrhagic.	Severe.	Mod. severe.	Mild.	Carriers.	Deaths.		
						Toxæmia.	Paralysis.	Laryng. and tracheal.
G 479	25 (5·2 %)	185 (38·6 %)	158 (32·9 %)	75 (15·6 %)	36 (7·7 %)	64	3	2*
I 187	4 (2·1 %)	39 (20·9 %)	78 (41·8 %)	47 (25·1 %)	19 (10·1 %)	13	–	1†
M 261	–	1 (0·4 %)	61 (22·3 %)	136 (52·1 %)	63 (24·2 %)	1	–	–
T 927	29 (3·1 %)	225 (24·2 %)	297 (32·1 %)	258 (27·8 %)	118 (12·8 %)	78	3	3

* Admitted 7th and 8th day of disease respectively. Tracheotomy on admission. Membrane on tonsils, larynx, and trachea. Died next day from respiratory obstruction.

† Admitted 5th day of disease. Post-measles pneumonia and laryngeal diphtheria. Tracheotomy on admission. Died 4 days later from pneumonia.

G = Gravis. I = Intermediate. M = Mitis. T = Total.

The mitis type while showing a slight increase in incidence has given no indication of an accession of killing power, the death-rate, in fact, remaining negligible. Parish (1934) thinks there is a possibility that the mitis strain might, at some future date, replace the gravis strain as the cause of high mortality. There is, however, no indication of this at present. In all those areas where the mitis strain predominates or has a high incidence the disease is comparatively mild.

TABLE III

Percentage Incidence of Deaths and Complications in 809 Cases (excluding Carriers and Infections due to Atypical and Mixed Strains)

Type.	Cases.	Paralysis.	Deaths—toxæmia and paralysis.
Gravis	443	73 (16·5 %)	67 (15·1 %)
Intermediate ..	168	17 (10·1 %)	13 (7·7 %)
Mitis	198	6 (3·0 %)	1 (0·5 %)

Dudley (1934) appears to be willing to apply the title "gravis" to the particular serological variety of starch-fermenting organisms that invaded the Greenwich Hospital School, on account of their ability to cause infections in Schick-negative subjects, but he is somewhat uncertain how far other serological groups of gravis organisms deserve this name on clinical and epidemiological grounds.

Although the Manchester gravis strains are of the same serological type as the Leeds and the Greenwich Hospital School, we do not think that there is yet any reason for reserving the term "gravis" for one particular serological type of the organisms so named by McLeod. Indeed, the available evidence seems to point to the contrary view. The serological type of gravis found in Hull is different from that of the Greenwich Hospital School, yet from the figures published by Leete et al. (1933), it appears to be fully entitled to this designation. Further, the results of Christison (1934) and Schiff and Werber (1935) in Berlin, where yet another serological type of gravis predominates, add further support to this view. It is quite possible that the various serological types of gravis described by Orr Ewing (1933) do differ in virulence (i.e., invasiveness). There is as yet no evidence on this point, but we think there is some clinical support for the view that at least three of the types are entitled to the designation "gravis" first applied to them by McLeod.

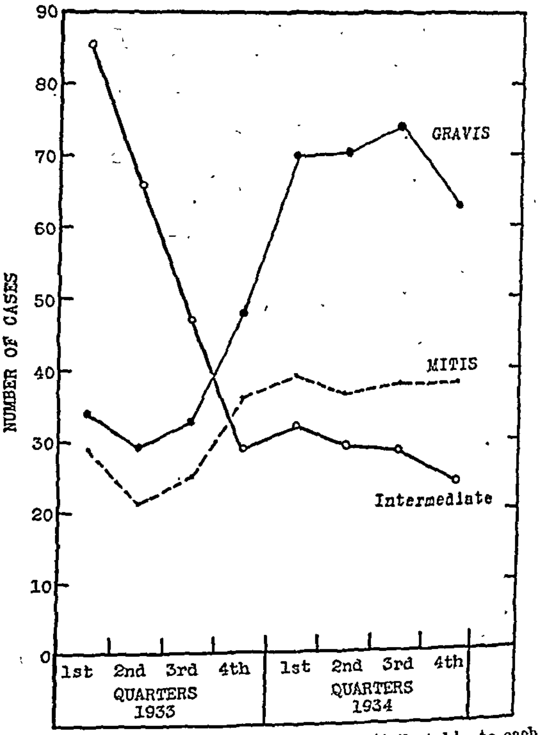

FIG. 1.—Number of cases of diphtheria attributable to each of the three types.

Laryngeal Diphtheria

During the last few years there has been a steady decline in the number of cases of laryngeal diphtheria in Manchester. Table IV. indicates the relative importance of the gravis and mitis strains in causing this type of infection. [illegible] where [illegible] is rarely limited to the [illegible] becoming involved by an extension downwards from the fauces. If, however, the larynx is the primary seat of infection there is a tendency for the membrane to involve rapidly the trachea and bronchi. Mitis infections of the larynx, on the other hand, are often limited to this site and seldom is there any concomitant involvement of the fauces or trachea. In the mitis laryngeal cases toxæmia is absent and they are dangerous only in so far as there may be an associated mechanical obstruction; whereas with gravis cases the mechanical factor is nearly always aggravated by superadded toxæmia from faucial infection.

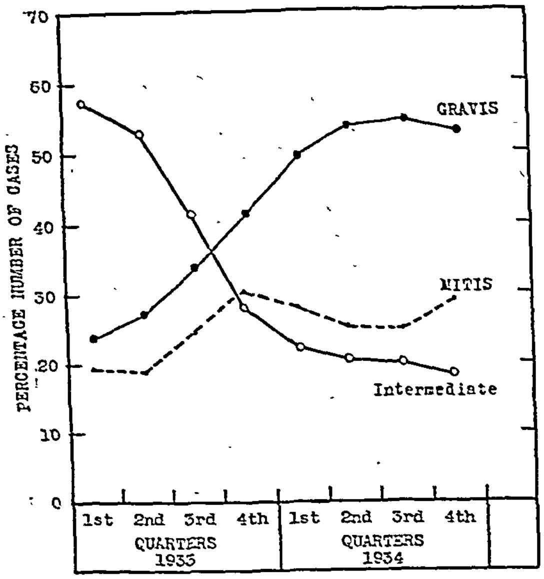

FIG. 2.—Percentage of cases due to each of the three types.

It is noteworthy in this respect that in some of the severe epidemics on the continent, notably in Berlin, laryngeal diphtheria tended to disappear and was replaced by a more toxic pharyngeal and nasal type of disease. A similar experience was noted in Leeds by Anderson and his colleagues (1931), and these workers take this fact as strengthening their concept that gravis is the cause of severe epidemic diphtheria and mitis the cause of sporadic or endemic cases which are on the whole definitely milder in their course. Our experience supports this contention.

TABLE IV

Types in Laryngeal Cases

—		Gravis.	Intermediate.	Mitis.
Faucial and laryngeal	..	9	1	8
Simple laryngeal	.. ..	2	–	11
Laryngeal and tracheal	..	2	–	–

The Time-factor in Treatment

Table V. records the average day of disease on which serum was given to those cases that recovered and to those that died from infections by the three types of organisms. It also shows the average day of disease on which death occurred. It will be noted that mitis infections were admitted to hospital approximately one day later than either gravis or intermediate infections, and yet with one exception they all recovered. In those gravis and intermediate cases that died, serum was given at about the same stage of infection as in those mitis cases that recovered. These figures show clearly that the time-factor in treatment plays no part in the explanation of the difference in killing power between gravis and mitis strains. They do indicate, however, the importance of early administration of serum, since the fatal cases received treatment on the average a day later than those that recovered.

TABLE V

Average Day of Disease on which Serum was given

—		Gravis.	Intermediate.	Mitis.
Average day of disease on which serum given to	Recoveries	3·5	3·4	4·2
	Deaths ..	4·3	4·4	5·0
Average day of disease on which death occurred		10·8	10·4	16·0

Infection in Schick-negative Reactors

Attention has been directed from time to time to the occasional occurrence of clinical diphtheria in Schick-negative reactors. This leads to questions about the exact significance of the negative Schick reaction and about the relationship between the degree of immunity indicated by this reaction and the degree necessary to prevent infection.

In a previous communication (1934) we pointed out that in our experience infections in Schick-negative subjects were always caused by gravis and intermediate strains. In other words, a negative Schick reaction seemed to be token of more complete resistance against mitis attack than against gravis or intermediate.

TABLE VI

Infections in Schick-negative Subjects

No.	Age.	Sex.	Severity.	Complications.	Type.
1	9	M.	Mild.	—	Gravis.
2	23	F.	,,	—	,,
3	19	F.	,,	—	,,
4	7	M.	,,	—	,,
5	7	F.	Mod. severe.	—	,,
6	9	F.	,,	—	,,
7	5	F.	Severe.	—	,,
8	10	F.	,,	Died.	,,
9	3	F.	,,	,,	,,
10	8	M.	Mild.	—	Intermediate.
11	2	M.	Mod. severe.	—	,,
12	5	F.	,,	—	,,
13	9	F.	Mild.	—	Gravis, mitis, and intermediate.

Our observations have since been confirmed by Dudley et al. (1934) at the Greenwich Hospital School, by Underwood (1935) at Leeds, and by Parish and Wright (1935) in London.

In the present series of cases we have encountered a further 13 instances of clinical diphtheria in persons in whom the Schick reaction was negative at the onset of the illness. Twelve of these were natural Schick-negatives, and one, a nurse, had been immunised with three 1 c.cm. injections of toxoid-antitoxin floccules (T.A.F.) three years previously and had been Schick-negative when tested six months later. She was still Schick-negative when tested on the day the illness began and during the interval had been constantly engaged in nursing cases of diphtheria. The Schick toxin used in determining all these reactions was that issued by Burroughs Wellcome and Co., and has always been satisfactory. Table VI. gives details of the cases.

While these cases were for the most part mild or moderately severe, it will be noticed that 3 are described as severe and 2 of these patients died from toxæmia. In neither case was the membrane extensive on admission to hospital, being limited in both instances to one tonsil. But in spite of large doses of antitoxin given intravenously and intramuscularly (each case received in all 140,000 units) the membrane continued to spread until both tonsils and the whole of the soft palate were covered. Death occurred on the seventeenth and ninth day of illness respectively. The Schick test was performed four hours before the administration of serum.

The rest of the cases recovered without complications. It will be seen that 9 were due to the gravis type and three to the intermediate, while one was a mixed infection containing the three types. The mitis strain in this last case was, however, avirulent, so that it may legitimately be excluded. None of the other strains was tested for virulence, since in our experience avirulent gravis and intermediate strains are rare.

These results, taken in conjunction with those in Tables II. and III., make it evident that gravis and to a less extent intermediate strains possess some property, much less apparent in mitis strains, which enables them to overcome the defences even of individuals who, judged by Schick test standards, might be expected to be immune. We have previously brought forward evidence (1934) that this property is one of increased invasiveness, while Povitzky, Eisner, and Jackson (1933) are of the opinion that it is one of capacity for more rapid production of toxin. The two fatal cases in our series emphasise clearly the potentialities of the gravis strain, for in spite of the combination of adequate serum therapy and the Schick level of natural immunity the disease progressed and the patient died. The claim, often made in the past, that clinical infection in Schick-negatives is always mild can obviously no longer be upheld—certainly not in areas where the gravis strain abounds.

There is no settled opinion as to the level of antitoxic immunity indicated by the Schick test carried out with present-day materials. At the present time 1/100 A.U. (antitoxin units) per c.cm. appears to be the figure usually accepted in this country, but it has varied from 1/500 to 1/30 A.U. Parish and Wright (1935) think that 1/50 A.U. per c.cm. will probably afford protection against gravis infection, but Underwood's (1935) results show that 1/5 A.U. was not sufficient to prevent infection in one case. It is impossible to state yet the lowest figure upon which we may rely with safety. We do not know the antitoxic content of the blood of our series of cases, but it is possible that the two fatal cases had the lowest figure consistent with a negative Schick reaction. The important point that emerges is that in communities where the gravis type abounds a negative Schick reaction, according to present-day standards, at least in this country, may not always be adequate to prevent infection. The problem promises to be no less important in the future, since, as Parish and Wright (1935) remark, "there is no doubt that coincident with the increased prevalence and severity of diphtheria in many areas of England, the number of cases reported in Schick-negative reactors has also tended to increase."

The increased prevalence and virulence of the gravis type in Manchester during the last eighteen months possibly has some bearing on the fact that our present series of Schick-negative infections is more severe than the former.

Until the safety level of immunity against gravis attack has been ascertained by future work, the question arises as to the remedy to be adopted under the present circumstances. The logical procedure is of course to raise still further, by active immunisation, the antitoxic content of the subject's blood in the hope that the safety level may thereby be reached. In this respect the following case is of interest.

A nurse, aged 19 years, was found to be naturally Schick-negative on March 1st, 1934. She received 1 c.cm. of toxoid-antitoxin floccules (T.A.F.) on March 15th, 1934, and again on March 29th, 1934. On May 9th, 1934, she was found to be suffering from clinical diphtheria. The membrane covered the whole of the right tonsil. She was Schick-tested and found to be negative. There was little or no toxæmia present; 24,000 units of antitoxin were given twelve hours after the Schick test had been performed. She recovered without complications. A gravis strain was isolated from the throat.

Parish and Wright (1935) state that "individuals who are 'natural' Schick-negative reactors may be given one injection of prophylactic at the time of the Schick reading, and periodically thereafter if further experience justifies this." The case described above suggests that periodic injections are advisable, especially in nurses and others who may be more intensively exposed to infection.

Infections in Immunised Subjects

We have found 11 instances of infection occurring in persons who had received three 1 c.cm. injections of toxoid-antitoxin mixture (T.A.M.) at least six months previously. Unfortunately no Schick tests were performed after immunisation, and we are unable to record the Schick state at the onset of the disease. Details are given in Table VII. One was a mild infection, five were moderately severe, and five were severe. One patient, aged 11 years, who had been immunised four years previously, died from toxæmia in the early stages of the disease.

TABLE VII

Infections in Immunised Subjects

Date of infection : 1934

No.	Age.	Sex.	Date of immunisation.	Severity.	Complications.	Type.
1	8	M.	1932	Mild.	—	Gravis.
2	12	F.	1929	Mod. severe.	—	,,
3	8	F.	1930	,,	—	,,
4	6	F.	1933	,,	—	,,
5	4	M.	1932	Severe.	—	,,
6	6	F.	1930	,,	—	,,
7	10	M.	1932	,,	Pp.	,,
8	6	M.	1931	,,	,,	,,
9	11	M.	1930	,,	Died.	,,
10	4	F.	1930	Mod. severe.	—	Intermediate.
11	6	F.	1933	,,	—	,,

Pp. =palatal paralysis.

Parish and Okell (1928) showed that of 973 children who had at one time been Schick-negative 2·9 per cent. relapsed within one to seven years, and that this occurrence was almost five times more common in those artificially immunised than in those naturally immune.

It is possible that some or all of the cases in Table VII. were instances of the relapsed state, since the severity of the disease was on the whole definitely greater than in the natural Schick-negative immunes. These cases therefore do not have quite the same significance as those recorded in Schick-negatives; but nevertheless they are worthy of record in that they confirm the importance of the gravis strain as the chief agent in the breakdown of immunity. These cases might be expected to have shown an accelerated response to the secondary stimulus of the disease, but the fact that only one infection was mild makes it evident that the response was on the whole inadequate. The prophylactic used in all these cases was toxoid-antitoxin mixture (T.A.M.), since this is the only one that has so far been employed on a large scale in Manchester. Case 2 in the first series (Table VI.) is an instance of infection after immunisation by toxoid-antitoxin floccules (T.A.F.). and Underwood (1935) has reported infections occurring in people immunised by means of formal toxoid (F.T.) and toxoid-antitoxin floccules (T.A.F.). as well as in some protected by means of toxoid-antitoxin mixture (T.A.M.)

There is ample experimental evidence that a sufficiency of antitoxin in the blood will protect against any type of organism, and the ideal of active immunisation should be to produce the highest level of antitoxic immunity for the longest period of time. As Parish and Wright (1935) point out, the tendency of late to reduce the number of inoculations is hardly conducive to this end and is likely to lead to a lower level of immunity and a greater number of relapses.

Dudley et al. (1934) are of the opinion that Schick immunity is less permanent than is generally believed, but that relapse of this immunity is of no great consequence since "the subject is left in a sensitised condition and will regain his antitoxic immunity promptly on contact with the toxigenic diphtheria bacillus." A perusal of our cases indicates that there are important exceptions to this conclusion and does not support Dudley's further statement that "generally the infection is latent, rarely there may be a day or two's trivial sore-throat."

The invasiveness and toxigenicity of gravis strains in some cases apparently outstrip the response of the relapsed Schick-immune.

In view of the potentialities of the gravis strain and the fact that the Schick level of immunity by no means always corresponds with the gravis safety level, it is evident that the loss of Schick immunity is definitely to be guarded against. The only certain method of doing this would be to continue the course of active immunisation after the Schick-negative state has been reached.

Summary and Conclusions

1. A striking alteration in the incidence of the gravis and intermediate types is shown to have taken place in Manchester during the past eighteen months. The position formerly occupied by the intermediate type as the epidemic strain has now been taken by the gravis type. There is no evidence that this change was brought about by the conversion of one type into another. Atypical strains were very rare.

2. Correlation of type with case-severity again shows that the gravis and intermediate types are the cause of the great majority of severe and fatal cases. Antitoxin, even when given in large quantities on the second and third day of disease, sometimes fails to save life. Mitis infections respond better even when the serum is given later. Gravis and intermediate cases are recognised and admitted to hospital on the average a day earlier than mitis cases.

3. Simple laryngeal cases are due usually to the mitis type and danger to life is chiefly mechanical. Complicated laryngeal cases are usually due to the gravis or intermediate type. Laryngeal diphtheria has shown a steady decline in Manchester during the last few years.

4. Whether by reason of greater invasiveness or enhanced rapidity of toxin-production some gravis and intermediate strains, especially the former, are able to cause clinical diphtheria in naturally Schick-negative subjects and those who have been immunised. Such cases described in this paper are on the whole more severe than any hitherto recorded.

5. There is no general agreement as to the level of antitoxic immunity betokened by a negative Schick reaction, but there is no doubt that the level indicated by present-day standards is not sufficiently high always to prevent infection by gravis strains. The logical remedy is to increase the antitoxic content of the blood as much as possible beyond the present Schick level. This must be accomplished by artificial immunisation, since natural latent immunisation is too uncertain a factor and may fail. All negative Schick-reactors, whether natural or artificial, should receive further prophylactic inoculations. The number of inoculations required to produce the level of immunity which will give safety from gravis strains will have to be determined by future experience.

We must express our thanks to Dr. D. Sage Sutherland for granting us facilities for investigating the cases in Monsall Fever Hospital, and also to the Ministry of Health for a grant to one of us (D. T. R.) towards the expenses of the work.

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MEDICINE AND THE LAW

Drunk but not in charge of a Car

THE Road Traffic Act, 1930, made it an offence to drive, attempt to drive, or be in charge of, a motor vehicle on a road or other public place when "under the influence of drink or a drug to such an extent as to be incapable of having proper control of the vehicle." There have been several decisions by magistrates as to how far a person is punishable as being "in charge" of a motor vehicle when the vehicle is in fact stationary. Last week at the Sheffield police-court a prosecution was launched where a person, undoubtedly under the influence of drink, had been shut up in a car to sleep it off. In effect the car had been treated as a police cell or hospital ward. The accused could not remember having been placed in the car, but other witnesses described what had happened. A Mr. Pearson saw him in a public-house and deemed him unfit to look after himself. With assistance, Mr. Pearson took him outside and put him in Mr. Pearson's car which was on a piece of spare ground. The car was so close to a wall that the left-hand door could not be opened, the other door was locked, the ignition key was removed, the lights were off, the brakes were on, and the car was left quite safe. Like a modern Good Samaritan, Mr. Pearson arranged with another man to take the patient home on the morrow when he had recovered; but the police found him and drove the vehicle to the police station where the accused was in so helpless a state that he had to be lifted out. The defending solicitor had no difficulty in convincing the bench that his client had been put in the car without his own knowledge and that he was unable to drive the car and had no intention of doing so. The case was therefore dismissed.

Death by Drowning

At an inquest last week a doctor who gave evidence observed that there is no justification for the popular belief that a body in the act of drowning rises three times to the surface. Some bodies may do so, but no inference can safely be drawn from the number of reappearances on the surface of the water. The specific gravity of the human body is very nearly that of ordinary water. The buoyancy of the body or of the clothes may raise a person to the surface soon after immersion; instinctive attempts at self-preservation will result in movements which may bring a non-swimmer upwards as if he were able to swim. The inspiration of water with air, desperate attempts to breathe and the inhalation of more water, cramp or shock, exhaustion and insensibility—all these are to be looked for in drowning, which is an asphyxia produced because water and not air penetrates the air-passages and lungs so that aeration of the blood is prevented. At the recent inquest the usual question arose as to marks found on the body. The relatives thought it possible that some violent blow had been struck before the body entered the water; there was, however, no reason to suppose that the marks were other than accidental. Text-book writers usually warn the student that external marks, where no explanation of their origin is established, give little help in establishing the fact of death from drowning.

Error in Death Certificate

Sir Samuel Brighouse adjourned a Lancashire inquest lately on evidence that the house physician at a hospital had signed a death certificate for a baby with a statement that it had died in the hospital when in fact it had died at its home. The coroner observed that hospitals must understand that they have to carry out their duties with proper care whether or not they are rewarded by financial payment. He found it unsatisfactory that the child should have been allowed to leave the hospital when, as the post-mortem examination showed, it had been very ill. Death was found to be due to toxæmia, an effect of infective gastro-enteritis, chronic meningitis and pericarditis. The house physician was asked why he gave a death certificate when he had not attended the child in its last illness. He replied that, when asked for a certificate, he telephoned to the Liverpool city coroner's office and related the facts to the coroner's officer who advised him that the best course was to sign. This being an application to an officer of another district, Sir Samuel Brighouse made his protest against the apparent encroachment upon his own functions. While the medical witness could perhaps hardly be expected to appreciate the technical aspects of jurisdiction, he could properly be pressed as to his knowledge of the child's illness and death. "How did you know the child was dead?" asked the coroner. "Somebody told you but you did not know. Recently I had a case where a medical man gave a certificate stating the cause of death and the person was not dead; the law ought to compel a doctor to see that a person is dead before giving a certificate." Sir Samuel made it clear that he did not blame the witness for the imperfect state of the law, but there had clearly been a serious error in stating that death took place in the hospital. The witness, apologising for his mistake, could only suggest that it was due to the fact that in all previous cases the certificates he had signed had related to deaths within the hospital.

INTERNATIONAL PHYSIOLOGICAL CONGRESS

IN LENINGRAD AND MOSCOW

THE fifteenth International Physiological Congress opened at Leningrad on the evening of Thursday, August 8th, with an informal reception in the marble hall of the Ethnographical Museum (Michailowsky Palace). The Physiological Society of the U.S.S.R. has worthy rooms at its disposal for the entertainment of its guests. As the curtains parted to admit them on arrival, the sudden view of the great hall with its vast pink marble columns and magnificent dado of green bronze, seen through a faint haze, made an overwhelming impression. The floor was thronged with people and the buffets laden with Russia's most delicious foods.

The formal opening took place the next morning in another fine building, the Uritzky Palace. Here, the hall of the former Duma was perfectly equipped for the purposes of a conference. Earphones were supplied to every seat, and by moving a plug from one hole to another the members could hear either the speaker's own voice or his speech translated into English, Russian, French, or German. This made it possible for the whole audience to follow every word.

Prof. IVAN PAVLOV, as president, welcomed the members of the Congress, and made reference to the loss physiology had suffered in the last year by the death of Sir E. Sharpey-Schafer and Prof. J. J. R. Macleod; the conference stood while Chopin's funeral march was played. Prof. Pavlov spoke in general terms, urging upon all scientists to be strong in internationalism. War is a bestial way of settling our differences and the Russian Government, he said, has declared that it will never lay hands on any foreign land.

The president of the committee organising the conference, the president of the Academy of Science of the U.S.S.R. (the aged Prof. KARPINSKY), and the president of the Leningrad Soviet all added their words of welcome and emphasised the superlative value which the Government of the U.S.S.R. attaches to scientific research.

The rest of the opening sitting was devoted to the address of Dr. W. B. CANNON of Boston. He paid special tribute to Prof. Pavlov, and congratulated him on the falseness of his prophecy, made three years ago at the Physiological Congress in Rome, when he expressed the opinion that that would be his last opportunity to address his fellow physiologists all assembled. Dr. Cannon talked first of general matters near to the hearts of all scientists: of those conditions which are unfavourable to scientific research and the discovery of the truth—a feeling of insecurity arising from political or financial causes, limitations set by hostile social establishments and interests, and general lack of financial support. Favourable conditions, on the other hand, are freedom to choose the scope of an inquiry without nationalistic limitations of expediency; freedom to pursue that inquiry without pressure to show results, which only ends in substituting anxiety for fertility of thought; and, finally, freedom for international exchange of students and ideas. As an instance of successful international coöperation, Dr. Cannon referred to his own work on the mode of action of autonomic nerves on their effector organs. Knowledge of the chemical transmission of nerve impulses has made considerable advance in the last three years, thanks to the work of investigators in Austria, Belgium, Canada, England, France, Germany, Holland, Hungary, Mexico, the Soviet Union, Switzerland, and the U.S.A. Dr. Cannon spoke further of the specific characteristics, differentiating the sympathetic mediator from adrenaline and justifying the special name of sympathin, which he had given to it in conjunction with his colleague, Z. M. Bacq.

Dr. Cannon opened the work of the sectional sittings on the following day, with an elaboration of the same theme, discussing the evidence for his suggestion that sympathin can be differentiated into sympathin *e* and sympathin *i*, the former being excitatory and the latter inhibitory. Numerous other papers in the same and allied fields were also presented, and, in all, somewhere about 500 papers were read in the various sections.

At a further plenary session of the whole conference in the hall of the Duma, on August 13th, Sir Joseph Barcroft (Cambridge) and Prof. L. Orbeli (Leningrad) gave addresses.

Sir JOSEPH BARCROFT spoke of the velocities of some physiological processes and discussed the possibility that the rate at which chemical processes occur may be a limiting factor of importance in the body. In the ordinary loading and unloading of oxygen, the chemical events take place so much more rapidly than the physical ones that the rate of the chemical phase of the reaction may be regarded as negligible. Though the rate of combination of hæmoglobin with oxygen may not be important in man, there are forms of life in which it is otherwise. In mice for instance, if the heart muscle contained ordinary hæmoglobin, it would not be possible to say that the time of oxidation of the hæmoglobin was quite inconsiderable as compared with the time of the diastole of the heart beat. The pigment in cardiac muscle is myoglobin not hæmoglobin, and the chemical reactions of myoglobin take only about one-sixth of the time taken by those of hæmoglobin; in the heart of the mouse and canary the pigment, actually, is not myoglobin but cytochrome, whose reactions are even faster. The rate of reaction of oxygenase and catalase and of carbonic anhydrase, which accelerates the conversion of carbonic acid into CO_2 and water, were also considered.

Prof. ORBELI spoke on pain and its physiological effects, discussing whether pain is perceived by the organ which perceives ordinary tactile stimuli or not, and describing various experiments carried out in his own laboratory and their bearing on the subject.

Continuation of Pavlov's Work

The time of the Congress was by no means wholly spent in the reading and hearing of papers. A great variety of other entertainments was offered, among which, particularly, visits to laboratories and scientific and medical institutions were of the greatest interest.

Naturally, of all the scientific work going on in Leningrad, that of Academician Pavlov (as his colleagues reverently call him) arouses the most curiosity. Excursions were arranged to the Leningrad branch of the All-Union Institute of Experimental Medicine (VIEM), which includes in its section of physiology a department presided over by Prof. Pavlov. Here are to be seen the specially constructed rooms and recording instruments when the work on conditioned reflexes in the dog and mouse is being continued. For the mice, whose reactions have to be measured by means of their motor response instead of by a secretory one, an ingenious cage has been devised in which the sleeping-room, dining-room, and intermediate passage are poised along the long axis of the bar of a balance, so that the dining-room descends when the mice enter it, anticipating food, and the movements of the cage are recorded electrically. The mice can distinguish between two different musical tones of which one becomes associated with the appearance of food and the other not. The possibility of converting a conditioned reflex into an instinct is still being studied.

Among the many other departments in the All-Union Institute of Experimental Medicine, Prof. E. S. London's department of physiology and pathology of metabolism was of special interest. The technique of securing cannulas in the great veins (renal, hepatic, &c.) of the abdomen has been perfected so that the cannulas can be left in position for months at a time and the blood of the dog can be directly investigated, as it goes to or from a given organ, after some particular procedure. Such a technique opens up a wide field of investigation.

Another direction into which Prof. Pavlov's work has led him is into the field of psychiatry. At the Psychiatric Polyclinic a section of 25 beds has been set aside for the purpose of investigation. Every fortnight Pavlov himself selects cases suitable for study; the two lines which are being investigated at present are epilepsy and the circumstances which condition an attack, and the stupor and delirium of schizophrenia. The cases and technique were demonstrated by Dr. IVANOV-SMOLENSKY.

In another institution, groups of 8 normal babies (4 boys and 4 girls) are selected from among orphans at birth and brought up together till about the age of 3 years, when they are adopted. On these children the development of conditioned reflexes is also studied under Prof. Pavlov. Several visitors remarked that it seemed well worth while to be an orphan, so admirably were the children cared for.

At Koltuchi, about an hour's run in a car outside Leningrad, a new biological station is being provided for Prof. Pavlov. Scientific work in it has hardly began as the buildings are scarcely completed. Here are Pavlov's own dwelling-house and laboratories, with palatial accommodation for the experimental dogs and monkeys (chimpanzees) and a very numerous staff to care for them.

Nutrition and Malnutrition

Nutrition is a subject which concerns the U.S.S.R. deeply and intimately, and those engaged in its investigation looked forward eagerly to the visit planned to the Central Institute of Nutrition in Moscow.

No very important material was presented to the sectional discussions in this field, but one impromptu communication was certainly of major interest and the paper of Prof. L. A. Tcherkess (Odessa) on "alitoxins" was stimulating.

At the International Conference on Vitamin Standardisation, held in London last summer, a great difficulty was encountered in connexion with the establishment of the standard for vitamin D, the antirachitic vitamin. The standard material adopted already in 1931 was a solution of irradiated ergosterol, but as the result of very numerous experiments it is now clear that all sources of vitamin D have not the same potency relative to one another when tested on the rat, as they have when tested on the chicken. What the position is with regard to man is still uncertain. During the Conference in Leningrad, Prof. Agnes F. Morgan (Berkeley, Calif.) presented a paper showing the comparative effect, on young rats receiving a complete diet, of large doses (4000 international units daily), of vitamin D derived from irradiated ergosterol, a tuna-liver oil concentrate, or a concentrate from cod-liver oil. The growth performance, serum-calcium level, ash content of the bones, and calcium content of the kidney were estimated as criteria of toxicity, and it was found that all the results showed that the phenomena of hypervitaminosis were much more definitely exhibited by the rats receiving irradiated ergosterol. This was evidence in favour of the existence in fish-liver oil concentrates of vitamin D in a form different from that which is produced by the ultra-violet irradiation of ergosterol.

In comment on this communication Dr. H. A. Weidlich (Danzig) reported that it had very recently been found in the laboratory of Prof. Windaus that an antirachitic substance can be derived from other sterols besides ergosterol, which have two double bonds in the second ring, such as cholesterol and stigmasterol, and that the antirachitic substance derived from cholesterol is as potent for chicks, in rat dosage, as cod-liver oil is.

The publication of this work will be eagerly looked for, and if it is fully substantiated it will probably lead to a rearrangement of the admittedly very unsatisfactory situation with regard to the international standard for vitamin D.

Prof. Tcherkess showed mice suffering from a severe dermatitis of nose, ears, and tail produced on a diet containing various uncooked cereals or legumes. The symptoms were not cured with yeast and were attributed by Prof. Tcherkess to toxins in the foodstuffs; but that the dermatitis is one in any way connected with the dermatitis of pellagra would appear doubtful.

Factories, Nurseries, and Palaces

Besides seeing laboratories and institutions, many members of the Congress visited factories, day nurseries, homes of rest for tired (but not sick) workers, medical and welfare centres, and a great variety of the activities controlled by the State. Many of these were extremely impressive, the main difficulty being to ascertain to what proportion of the population the benefits and services as yet applied. Special arrangements were made to open, as often as was necessary, the treasury in the Hermitage Museum, where were locked up the famous collection of Scythian gold ornaments, so that very many visitors were able to enjoy this unique sight.

Besides these visits of small parties to such a variety of interesting places the hospitable Russians arranged two mass migrations out of Leningrad, of the whole conference, once to Peterhof and once to Dietskoye (ci-devant Tsarskoye) Selo. On the evening of August 10th over 1000 of the 1500 members were carried out, in 200 motor-cars, an hour's drive into the country, welcomed all the way with hand-waving and cheers. Peterhof must have been used by the Czars to impress their guests, and the remark was overheard that here alone was excuse enough for a revolution. Palaces of enormous magnificence, fountains that far outsprayed the *grandes eaux* at Versailles, gilded statues and gorgeous furnishings were revealed continuously for more than two hours. In the reception-rooms of the palace hundreds of candles were specially lit to give the physiologists a glimpse of the palace's appearance under the old régime. Finally, when the long lingering daylight had gone at last, the fountains were floodlit in many colours.

In the excursion to Dietskoye Selo, the palace containing the private rooms of the Romanoffs was first shown. Everything was still in position, the walls being covered with the Empress' personal photographs. A banquet was served in the Cameron gallery of the Catherine Palace and the scene cannot have differed greatly, save in the humble attire of the guests, from a similar occasion in the days of the Czars. The party ended with fireworks, making lovely effects on trees and water.

The next day the Congress ended at Leningrad and the members departed in a thunderstorm, which flooded the streets six inches deep and littered them with the consequent disruption of the wood-paving. Till then the weather had been perfect and many will remember Leningrad as the city of wonderful sky effects.

In Moscow

Arrived in Moscow last Saturday, the Congress met again in plenary session, for its final sitting, in the hall of the conservatory of music. Addresses were given by Prof. L. Lapicque (Paris) and Prof. A. Ukhtomsky (Leningrad). Prof. A. V. Hill (London), as vice-president of the meeting, reported the suggestions which had been made to the international committee with regard to the next meeting in 1938. An invitation had been received from Prof. Hess, in the name of the Swiss Physiological Society, to hold the meeting in Zürich, and an intimation from the Hungarian physiologists that they would like to welcome the Congress in 1938 or 1941. The international committee received the communication from Hungary very sympathetically, but since 1938 would be the jubilee of the conference, the first one having been held in 1889 in Switzerland, it was felt that Switzerland would be a very appropriate place.

Various modifications in procedure were suggested for future congresses, and it was announced that Prof. A. V. Hill was to be permanent secretary to the international committee.

Finally, Prof. Hill called upon Prof. G. Barger (Edinburgh) to return the thanks of the Congress to Prof. Pavlov and the organising committee. Prof. Barger expressed his feeling of veneration and affection directly to Prof. Pavlov in German. "Sie sind," he said, "facile princeps physiologorum mundi." He spoke further of the rivalry that there had been in Rome between physiology and ancient monuments; but here in Russia the rivalry was not with the past, but rather with history in the making, even with the chance of a glimpse into the future. Other words were added in English, French, German, Italian, Spanish, Swedish, Dutch, and Russian, so that all felt that they were taking part in expressing their gratitude for the charming welcome which had been prepared for them.

Hertford Hospital, Paris.—The response to the Silver Jubilee appeal on behalf of this hospital now exceeds £8000.

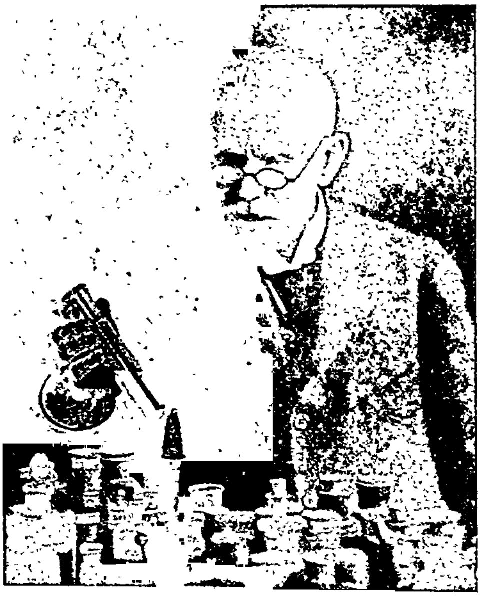
New Hospital for Newcastle-on-Tyne.—A new hospital, which will cost £15,000, is to be built in the grounds of the Home for Incurables at Spital Tongues, Newcastle, to replace the original Holy Jesus Hospital in City-road. The old institution cannot be altered to meet modern requirements.

PAUL EHRLICH

1854–1915

TWENTY YEARS AFTER HIS DEATH

[We owe the following reminiscent memoir of Paul Ehrlich to Miss Martha Marquardt, who was formerly and for a long time his secretary and whose detailed book concerning him was reviewed in The Lancet at the time of its appearance in 1924. She reminds our readers that 20 years have passed since his death at the age of 61, and that the twentieth anniversary of that death occurred on Tuesday last, August 20th.]



Ehrlich in his laboratory.

Paul Ehrlich, the famous inventor of the remedy 606, or Salvarsan, had he lived, would have been 80 years old on March 14th, 1934. And now 20 years have passed since his death. But 61 years of age, he had been summoned much too soon to eternity. Those standing on a pedestal, worshipped from afar, do not always stand the test in private life. Paul Ehrlich, among the world's greatest men was the most lovable human being, of great simplicity and sweetness of nature, liberal and broad-minded in viewpoint, always ready to support and encourage especially those engaged in scientific pursuit, charitable without limits. Born in Strehlen, Silesia, he was a descendant of a Jewish family, of which his cousin, the pathologist Carl Weigert, was also an offspring. His parents were innkeepers, but while his mother attended to business his father was given to meditation and the discussion of philosophical problems. At school, the boy Paul did not distinguish himself, although he liked Latin on account of its logical structure; when at college at Breslau he dreaded examinations, and during all his life he had the greatest sympathy with poor examinees. In his leaving examination the proposed thesis was to write an essay on Life as a Dream, and young Paul argued that life depended on the normal process of oxidation, that the activity of the brain is such a process, and that the dream also is a sort of oxidation, a fluorescence of the brain. This his examiners considered as a joke, and had it not been for his excellent Latin he would have failed. As a student Ehrlich followed up his own ideas and attended only such lectures as specially interested him. He was the first to work on aniline dyes when these were brought out by the German factories in the latter part of the past century, and a dissertation at the time, treating largely of the subject, of which nothing was known by anyone, and which he himself must have forgotten, was not discovered until after his death. His pioneer work on the microchemical relation of the dead and living tissues to dyestuffs was a consequence of these studies. When Robert Koch discovered the tubercle bacilli, it took Ehrlich but 24 hours—of close experimental work, to be sure—to find a dyestuff reaction necessary to demonstrate the presence of the bacilli, and the test is still largely in use in laboratories. Other dyestuff reactions in great number, due to his work, are found useful in medical differentiation, while his studies of toxins, of the chemistry of immunity, and his ingenious "side-chain theory" made his name famous. The discovery of salvarsan drew the attention of the world in general upon him, and stands out as his greatest therapeutic achievement.

Ehrlich was gifted with an infinite capacity for work, impatient but kindly, he was always pressing forward eagerly to his goal; yet he performed his experimental work with the simplest of apparatus. The outfit of his laboratory consisted of innumerable bottles of dyestuffs and reagents, scattered in a seemingly unintentional manner on an immense working table—only he himself knew their significance; for the rest his equipment was completed by a Bunsen burner, a few test-tubes, running water, and large sheets of white blotting paper on which he could watch the colouring of dyestuff solutions resulting from the test-tube experiments as they were poured out. His intuition enabled him to draw from a simple experiment bold, if not audacious, conclusions offering the most promising lines of further research. He used to say that he could just as well, if necessary, work in a barn. In fact, his first Institute for Serum Investigation in Steglitz, near Berlin, before going to Frankfort, consisted of an old barn and an old bakery, primitively fitted out for his purposes. One of his mottoes was "Much work, little publication, no preliminary communications, and no guesswork," and he followed it exactly in his devotion to progress in medical science. Salvarsan was discovered in 1907; two years of careful animal experimentation and another year of clinical testing under minutely controlled conditions followed before, in 1910, the results were published. In not quite five months the drug could be manufactured on a scale sufficient to allow it to be put on the market, but 65,000 free samples were distributed gratuitously by Ehrlich to the hospitals and doctors assisting in the first clinical tests. Though apparently in contradiction to what has been said, Ehrlich always pointed out that salvarsan had come into being merely as a by-product of a research started with purely theoretical aims; and Ehrlich's whole career gives striking proof of pursuit of knowledge for its own sake.

In my biography of him [1] I have told of his many idiosyncrasies which endeared him to his friends and assistants. He would explain his theories with diagrams and drawings which he would chalk up on the table, the door, the floor, his cuffs, and even on the soles of his shoes while talking about his work. He had a special love for popular music, and while in his laboratory at work he liked to hear a barrel organ playing outside. He loved bright-coloured and intensely fragrant flowers, gaily coloured pencils and cards for making notes, while he played a special game of patience which never came out. He could watch birds, insects, or a tiny plant on the bare stump of a tree for hours. There were two luxuries he allowed himself: first, good cigars of great strength which he puffed while making notes or dictating lectures or letters and which were laid down or forgotten only when experimenting over the Bunsen burner. Secondly, he bought books, making notes and markings in the margins of most of them while reading. When asked to return a borrowed book—like many others he forgot to give them back—he had to buy new copies because the pages of those which had been under his hands might be covered with chemical notes. And for leisure he preferred reading detective stories, though these could not distract his thoughts from scientific matters, judging from the notes and sketches with which he would adorn both covers and contents. Knowing his taste, Sir Arthur Conan Doyle would send his "great colleague" copies of the "Sherlock Holmes" books, while on Saturday evenings, when a 30-pfennig copy of a detective magazine appeared with fantastic pictures on the cover, neither the card-playing nor music could interest him.

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[1] Paul Ehrlich als Mensch und Arbeiter (Deutsche Verlagsanstalt, Stuttgart, 1924).

Numerous honours were bestowed upon him, and he shared the Nobel prize in 1908 with Prof. Metchnikoff. He had medals and titles, but nothing conferred upon him did he enjoy as much as his honorary membership of the German Chemical Society. Failing health and the world war clouded the last year of Ehrlich's life. He was deeply distressed over the war, convinced that it should have been avoided and anticipating many of the troubles it would bring to all. The break in his scientific coöperation with friends abroad was a painful experience to his true and kind heart. He died on August 20th, 1915, of an apoplectic stroke, truly a victim of the world conditions, the cruelties of which preyed on his mind. Had he been spared some years, probably more great contributions would have been made by his genius to medical science; but he has inspired with his ideas chemists, experimental pathologists, and clinicians the world over, who are following in the footsteps of a great benefactor of mankind.

IRELAND

(FROM OUR OWN CORRESPONDENT)

PUBLIC HEALTH WORK IN CORK

THE two most striking features of Dr. J. C. Saunders's report as medical officer of health for Cork are his observations on diphtheria and on milk. Last year there were 113 cases of diphtheria in the city with 25 deaths—a case-mortality of 22·1 per cent., compared with 12·8 per cent. in 1933 and 20 per cent. in 1932. For the past six years Dr. Saunders has been very active in carrying out immunisation against the disease, and no less than 12,000 children have been immunised. He is able to report that, notwithstanding the severe type of diphtheria prevalent, not a single immunised child has died of the disease, whereas during the same period over 180 untreated children have died of it.

milk Dr. Saunders finds that the proportion

shows a tendency to increase. In 1934 of 2 ordinary samples no less than 72·2 per cent. w "dirty," and 35·4 per cent. "very dirty"—that to say, grossly contaminated with dirt of ev description—manure, stable dust, road dust. T pasteurised milk was also unsatisfactory. The aver bacterial count over the whole number of samp of pasteurised milk examined was 244,000 per c.c which is more than twice the number (100,0 ordinarily taken as permissible. Dr. Saunders su up his survey by saying that there is evidence "almost universal carelessness and lack of hygi methods in the production of the ordinary m supply to the city." One may hope that there be some improvement as a result of the legislat recently passed.

On some other points Dr. Saunders can cl progress. Typhoid fever had dwindled to neglig proportions. The death-rate from pulmonary tu culosis was 1·34 per 1000 of the population, lowest figure recorded. The infantile mortal rate was 72·3 per 1000 births, the figure for previous year being 89.

PROPOSED TREATMENT OF EARLY INSANITY

Dr. O'Connor Donelan, resident medical sup intendent of the Grangegorman Mental Hospi Dublin—the principal public mental hospital Ireland—made an interesting proposal to the co mittee of the hospital last week. He suggested t mental clinics should be established at one or m of the clinical hospitals of Dublin, on the und standing that a medical officer of his staff sho be deputed to attend at those hospitals for a speci period once or twice a week, for the purpose of as ing the hospital physicians in the diagnosis treatment of such patients as might present th selves. Such a scheme should be combined with admission of voluntary patients to mental hospi He believes that this plan offers the best cha of dealing successfully with mental illness in early stages. The committee agreed, and deci in the first instance, to communicate with two the city hospitals with a view to its adoption.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

PLIGHT OF THE MEDICAL PROFESSION

IN a presidential address to the Royal Societ Medicine of Budapest, Prof. Tibor Verebély la spoke in moving terms of the anxious responsib which leading members of the medical commu felt for the status of their profession. Many of colleagues were finding it impossible to earn a de livelihood, while in the medical schools the tea were full of sympathy for students who were trying to assimilate an excess of information an the same time to support themselves. It was wonder that so many of them failed to finish courses. Prof. Verebély spoke with distress of complaints which daily reached the Board of Medical Association and which showed the strai which some unfortunate medical men had driven in desperation.

TWO PROFESSORS HONOURED

Marble statues have been erected in Budape memory of two teachers at the University. Ign Hirschler was famous as professor of ophthalmo and Vilmos Tauffer as an obstetrician and gynæcologist. Soon after his tragic death I gave some account in THE LANCET of Prof. Tauffer's work (1935, i., 766). The statues have been erected through the generosity of Leo Goldberger de Buda, a silk manufacturer.

RETIREMENT OF UNIVERSITY PROFESSORS

Under the rule that university professors must retire at the age of 68, the University of Budapest has said goodbye to five professors whose places it will be hard to fill. Baron Alexander Korányi, professor of internal medicine, Emile de Grosz, president of the International Association for the Campaign against Trachoma and professor of ophthalmology, Stefan Tóth, professor of obstetrics and gynæcology, Géza Illyés, professor of surgical urology, and Charles Schaffer, professor of neurology and psychology, have all resigned from their chairs.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

BATHER'S ITCH

SCHISTOSOME dermatitis, commonly called bather's itch, was described first by Cort in the United States (1928) and has since been reported from Wales[1] and from France. The cause has been shown to be the free swimming larval forms of certain species of schistosomatidæ. In the course of their normal life cycle these larvæ penetrate the skins of certain waterfowl or small mammals and find their way through the circulatory system to the liver. When they penetrate human skin they appear to lose their way and to die, the proteins so released giving rise to a skin allergy.

An essential part of the life cycle of these schistosomes is spent in snails which thrive on shallow beaches. In the Michigan lakes *Limnæa stagnalis* and *L. palustris* are found to be hosts to the embryonic forms of schistosoma. Where the shore line slopes rapidly to a depth of 20 feet or more snails are scarce and swimmers itch is not likely to be met with. Where the beach is shallow collectors in bathing dress or wading boots are able to find the responsible snails and to warn bathers of the danger. It has recently been found that on Burt Lake, Michigan, cases of dermatitis were occurring among bathers although no snails could be discovered on the beach. The solution of this puzzle was reached when Mr. Glading and Miss Hughson donned helmets of the kind devised by Mr. William Beebe and explored the deeper water. Snails were then found in abundance at depths from 6 to 18 feet.

No way of eliminating either the cercaria or the snail hosts has yet been devised for large bodies of water. All that can be done is to map the snail beds and warn would-be swimmers of the risk.

WATER-BORNE AMŒBIC DYSENTERY

In connexion with the investigation made by the U.S. Public Health Service into the epidemic of amœbic dysentery that originated in Chicago in 1933 an interesting supplementary study[2] has been made into an outbreak of enteric infection following the
big stockyard fire in Chicago in May, 1934
and spectators were both affected. En
made its appearance in such amount as t
the most serious epidemic of this disease
Chicago has suffered in many years.

The investigators found that the Union
had two sources of water-supply—that i
private supply as well as the city water.
was derived from two sources, one of
derived from a sewer. This water was u
emergency and was normally filtered and
For some reason on the day of the fire
chlorinated and the demand created by t
so great that adequate filtration was
Only a few of the firemen besides the e
the stockyards were aware of the dual w
and that one source of water was *not fit for*

Classical cases of amœbic dysentery wer
among the firemen. However it was be
E. histolytica was the important ætiolo
among the more severe infections on th
grounds: (1) *E. histolytica* were found in
thirds on one stool examination only; (
logical studies failed to reveal other
agents; (3) treatment with a specific amo
remarkably efficient; (4) the late sym
course of the illness were quite chara
amœbic infections. As controls 161 fi
present at this fire were examined and *E*
were found in the stools of 25 (15·5 per c
is regarded as a "high normal" inciden
not possible to make as thorough a sur
spectators as of the group of firemen. H
undoubted cases of amœbic dysentery
milder and less typical cases are known to ha
amongst them.

This study provides unusually clear an
evidence that infection with amœbic dys
be water-borne and give rise, like other
enteric infections, to an explosive epidem

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE W
AUGUST 10TH, 1935

Notifications.—*The following cases o*
disease were notified during the week:
0; scarlet fever, 1565; diphtheria, 80
fever, 56; acute pneumonia (primary or
451; puerperal fever, 37; puerperal py
cerebro-spinal fever, 12; acute poliom
encephalitis lethargica, 4; dysentery, 21;
neonatorum, 87. No case of cholera,
typhus fever was notified during the week

The number of cases in the Infectious Ho
London County Council on August 16th was
included: Scarlet fever, 729; diphtheria, 946;
whooping-cough, 431; puerperal fever, 17 mo
baby); encephalitis lethargica, 269; poliomye
St. Margaret's Hospital there were 20 babies (pl
with *ophthalmia neonatorum.*

Deaths.—In 121 great towns, includi
there was no death from small-pox, 1 (0)
fever, 7 (0) from measles, 3 (0) from sc
14 (5) from whooping-cough, 21 (1) from
52 (5) from diarrhœa and enteritis under
and 16 (1) from influenza. The figures in
are those for London itself.

The deaths from diarrhœa and enteritis are n
whole, the highest numbers being Liverpool 10,
Leeds 4, Willesden 3. Liverpool also reported
measles. Liverpool and Sheffield each had 3
diphtheria; no other large town more than 1. T
from enteric fever was at Birmingham.

The number of stillbirths notified durin
was 260 (corresponding to a rate of 45 pe
births), including 44 in London.

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[1] Trans. Roy. Soc. Trop. Med., 1930, xxiii., 421; 1930, xxiv., 219: see THE LANCET, 1930, ii., 752, 870.

[2] Hardy, A. V., and Spector, B. K.: The occurrence of infestations with *E. histolytica* associated with water-borne epidemic diseases. Reprint 1676 from Public Health Reports, Washington. 1935. 5 cents.

PUBLIC HEALTH

Manchester Hospitals

THE liaison between the voluntary and municipal hospitals in Manchester is likely to become more intimate. Some months ago the medical officer of health, Dr. Veitch Clark, submitted a scheme for reorganising the specialist services of the municipal hospitals, in which he drew attention to the necessity of "interlacing" the consulting staff with that of the voluntary hospitals. His scheme provided that all acutely ill patients in corporation hospitals should be seen on admission by specialists who would remain responsible for their diagnosis and subsequent treatment. Obviously the appointment of these consultants was a matter in which the Royal Infirmary and other teaching hospitals were interested and the public health committee has now approved the setting up for the purpose of a joint hospitals advisory board. This board will consist of ten members of the health committee, including the medical officer himself, six members of the voluntary hospitals statutory committee, and five nominees of the university. Of these five it is presumed three will be the occupants of the chairs of medicine, surgery, and obstetrics, and one the vice-chancellor of the university, Prof. J. S. B. Stopford, whose independent position would make him an admirable chairman. The scheme would entail a regrouping of hospitals; the Withington municipal hospital for instance would be associated with the Royal Infirmary, St. Mary's Hospital, and the Eye Hospital; Crumpsall municipal hospital with two other voluntary hospitals, Ancoats and the Northern. In course of time no doubt this would lead to the concentration of grave cases in certain hospitals and to some selection of patients, although it is realised at the outset that the clinical policy of the Royal Infirmary could not be altered without much thought and consultation with the various groups of supporters. The chairman of the public health committee, Councillor R. G. Edwards, has pointed out that the setting up of such a board would go further than the clause in the Local Government Act, 1929, enjoining consultation between the local authority and the voluntary hospitals in the area. It would, he hoped, work out so that no patient would have to wait for treatment at any hospital, voluntary or municipal. Mr. Walter Coppett, chairman of the Royal Infirmary, has expressed a similar view, and especially welcomes the introduction into municipal hospitals of the principles of administration which have been so successful a part of the voluntary hospital system. Besides reducing the long waiting-lists, the scheme would lead, he thought, to further search for new methods of treatment and to improvements in teaching. The scheme will now go forward to the city council as an agreed measure.

Sequel to a Pilgrimage

Following a pilgrimage to Lourdes undertaken by 1100 people from all parts of Scotland, a total to date of 75 cases of typhoid fever has been recorded. The pilgrims left Glasgow in the *Athenia* on July 12th for Le Verdon and returned home on the 23rd. On August 5th a case of enteric fever was removed to a Glasgow hospital, and on the following morning a second case was reported by the medical officer of health for Dunbartonshire. Other cases of illness were then discovered, the onset being between July 27th and August 10th, most of them nearer the later date. Prompt action by the health department of Glasgow in following up all the pilgrims, together with the crew of 327, led to the discovery among the former of 38 cases in which bacteriological confirmation of a typhoid infection was obtained. After consultation with the Department of Health, the Glasgow M.O.H. undertook to supply a list of pilgrims to all local authorities involved, which has resulted in 37 further cases of fever being brought to light in the counties and burghs of Scotland. In view of a second pilgrimage to leave Liverpool on July 24th and Dublin on the 25th by the same ship and the same route, the Ministry of Health determined to supply medical officers of health with the names and addresses of pilgrims, and to request that any cases of typhoid occurring in England and associated with this voyage should be intimated to them. So far, most of the cases have been in women, probably because they were in the majority. The ship's crew were not affected; they remained on board the ship at Le Verdon, and only one visited Lourdes.

The range of dates of sickening is consistent with infection having taken place "somewhere in France," but the common source of infection is difficult to determine on the evidence at present available. Food and drink were partaken at an intermediate station where, the pilgrims state, there was a plague of flies and water was available of two different qualities—viz., "eau potable" and "for other purposes." Investigation is being made by the Glasgow M.O.H. to ascertain all possible sources of infection, whether carrier or vehicle (fruits, vegetables, meat, water, insects, &c.), from histories obtained from the pilgrims.

The infection is of a severe type, four deaths having resulted to date: two in Glasgow and two in Lanarkshire. The outstanding clinical features are high fever, headache, backache, epistaxis, rose spots, and constipation; a number of the patients have been regarded as suffering from lumbago, influenza, or sun-stroke until the visit of the local health officer. A close observation is being kept on all home contacts to prevent the spread of infection among the community by missed ambulant cases or carriers, and on all persons receiving fomites, water, and foodstuffs from the returned pilgrims.

Enteric infection has been fairly prevalent this year in Scotland, but mainly of the paratyphoid group. A fresh strain of *Bacillus typhosus* has been introduced into a community the epidemic constitution of which is vulnerable.

Food Poisoning in North London

Last week the St. Pancras coroner, Mr. Bentley Purchase, opened an inquiry into the death of four middle-aged persons, a man and three women, who had died within a few days of eating a vegetarian dish known as nut meat brawn. The health authority of St. Pancras was able to identify the poisonous material in a supply of this food, the sales of which were promptly stopped, and the outbreak controlled. The symptoms in all four cases suggested poisoning by a preformed toxin rather than any of the commoner forms of bacterial poisoning, and suspicion naturally turned on botulism. The inquests were adjourned until to-day (Friday). But the characteristic symptoms which were at once correctly interpreted by the practitioner who was called in, and the laboratory findings, leave little doubt that *B. botulinus* was the source of the toxin.

OBITUARY

JOHN ANDERSON, D.S.O., M.B. Aberd., F.R.C.S. Edin.

Prof. Anderson, who died on August 17th at Dundee after a long illness, was a surgeon of wide repute and a citizen revered throughout lowland Scotland. John Anderson, who bore his father's name, was born in 1886 at Macduff, Banffshire, and graduated in medicine at Aberdeen in 1908. He then began his lifelong association with Dundee by serving as house surgeon at the Royal Infirmary, after which he spent two wander years, first as surgical officer at the Beckett Hospital, Barnsley, and then at Tübingen and Berlin. On his return to Dundee in 1911 he was appointed to the surgical staff of the Infirmary, of which he was at the time of his death senior surgeon, having two years ago succeeded the late Prof. Turton Price in that office and in the university chair of surgery. He also held many other surgical appointments in Dundee and Perth and was consulting surgeon in surgical tuberculosis to most of the hospitals in the area. As surgeon to King's Cross Hospital and Ashludie Sanatorium he had the opportunity of helping to frame the policy of an enlightened local authority.

[*Photograph by Drummond Young*

PROF ANDERSON

His career was interrupted early by the outbreak of war, and joining the R.A.M.C. in 1914 he was made surgical specialist to the 20th Casualty Clearing Station in France and served for a time as consulting surgeon to the 3rd Army. He was twice mentioned in dispatches and in 1918 was awarded the D.S.O. Not long ago, in a public lecture at University College, Dundee, he reminded his hearers of the conditions under which surgery was done in the early months of the war, and threw light on the unparalleled opportunities for resource and craftsmanship under circumstances which might have dismayed anyone of lesser mettle. He was a member of a team of six surgeons working in shifts of 15 hours by electric light generated by a motor-cycle engine and shaded by petrol tins; it was then, he said, that he came to understand something of the difficulties which Joseph Lister had to surmount. His war experience led him to write in an official book on the treatment of cranial injuries and in current medical journals on penetrating wounds of the chest and unusual fractures of the patella. When he returned to civil practice it was the same story of energy, assurance, and conscientiousness, for no one without these qualities could have come to fill the place he did in the life of the community. It was his conviction that the State would play an increasing part, financial and administrative, in the hospitals of the country, and he wished to be forearmed for this change. The chairman of the hospital board attributes much of the success of the Dundee Infirmary to his wholehearted coöperation. It was, he writes, Anderson's great interest in life; rich or poor, simple or otherwise, everybody was the same to him and he was the same man to all. He was very kindly and humane, and his presence was an unfailing reassurance at anyone's bedside.

Anderson kept up his habit of foreign travel and studied the technique of many continental as well as British clinics. The application of high-frequency current to surgery early claimed his attention; it was after working for 15 years with a small Schall apparatus that he related his experience at a meeting of the Royal Society of Medicine, insisting that surgical diathermy had a wider application in treatment than was then realised in this country. His results with radical removal of breast cancer by the diathermy knife had shown him that primary union was the rule and the stay in hospital shortened. He used the cutting current for all biopsies because it eliminated the risk of spreading cancer cells, and the method had enabled him to remove cancers of the tongue which were pronounced inoperable. His address which was followed with the closest attention led a number of his hearers to try the method for themselves.

Prof. D. P. D. Wilkie writes: "Those who had the privilege of knowing John Anderson mourn to-day the passing not only of a gifted surgeon, but of a singularly attractive personality. Combined with a great capacity for hard work he had a flair for friendship and enjoyment and his ready sense of humour and boyish outlook made him a gay companion and a genial friend. In the war a very gallant army surgeon, he brought back into civil surgery more fully than almost any of his comrades the useful lessons of war-time experience. A born traveller and a ready assimilator of new ideas he was perhaps more conversant with the practical aspects of American and European surgery than any other surgeon in this country. As a member of the Moynihan Chirurgical Club he was a welcome and a regular attender at nearly every meeting and, late or early, some form of rapid transport would always bring him to the meetings. Living intensely, with a high sense of duty and a spirit always greater than his bodily physique, Anderson crowded into his comparatively brief career as surgeon a wealth of sterling work and no less of kindness and of friendship. He leaves behind him a very happy memory of a keen, debonair and handsome surgeon, a sportsman, and a true and loyal friend."

In private life Prof. Anderson used his scanty leisure for shooting and angling expeditions in the Highlands. He married in 1930 the only child of Maj.-General E. G. Sinclair-Maclagan, who is left with two young children.

HUGH WALKER, M.A. Glasg., M.B. Edin., F.R.F.P.S. Glasg.

Dr. Hugh Walker, who died in a Glasgow nursing-home on August 9th in his seventieth year, was well known in western Scotland as an ophthalmic surgeon. Eldest son of Dr. William Walker, who practised for nearly 60 years in Pollokshaws, he went to the Old High School in Elmbank-street, Glasgow, and from there with a bursary to Glasgow University where he took his M.A. He then went on to Edinburgh for his medical studies which he completed in 1893 with first-class honours in the M.B. and the Beaney prize in anatomy and surgery. After a year or two in general practice he discovered his ophthalmic bent. He was a good mathematician and had attended Tait's course of physics in Edinburgh, and on a visit to Berlin acted as assistant to Prof. C. R. Greeff, and undertook the translation of his Guide to the Microscopical Examination of the Eye, which went through three editions. From pathologist to the Glasgow Ophthalmic Institute and assistant to Dr. Maitland Ramsay, in 1903 he became surgeon to the ophthalmic department of the Victoria Infirmary, only retiring four years ago on reaching the age limit. During the war he was attached to the Serbian army as eye specialist learning the Serbian language and acting as interpreter—he already knew German well; for his services he was decorated with the Order of St. Sava. On his return to Glasgow he resumed private practice with the late Dr. Freeland Fergus, and was at work until a month or two ago. Dr. Walker was employed as ophthalmic surgeon by the Glasgow school board; he was himself a member of the Eastwood board and keenly interested in its work. His colleagues found him always ready with helpful advice, and he had a kindly smile for everyone. He is survived by his wife, a sister of the town clerk of Edinburgh; his younger brother, Dr. W. Kerr Walker, is still in practice in Pollokshaws.

CORRESPONDENCE

NOMENCLATURE OF CORPUS LUTEUM HORMONE

To the Editor of THE LANCET

SIR,—During the past year the progestational hormone has been isolated from the corpus luteum in pure form and its constitution established. Heretofore two different names have been used for this hormone (progestin, luteosterone). For the sake of international uniformity we agree to use hereafter in the scientific literature only the name *progesterone* for the pure hormone. As is known, the pure hormone exists in two different forms, one melting at 128° (uncorr.) and the other at 121° (uncorr.). The higher melting form (Compound B of Wintersteiner and Allen [1] and Compound C of Slotta, Ruschig, and Fels [2]) will be known as α progesterone and the lower melting form (Compound C of Wintersteiner and Allen and Compound D of Slotta, Ruschig, and Fels) as β progesterone. We hope that these names will be generally accepted.

We are, Sir, yours faithfully,

W. M. ALLEN (Rochester, N.Y.),
A. BUTENANDT (Danzig),
G. W. CORNER (Rochester, N.Y.),
K. H. SLOTTA (Breslau).

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[1] Wintersteiner, O., and Allen, W. M.: Jour. Biol. Chem., 1934, cvii., 321.

[2] Slotta, K. H., Ruschig, H., and Fels, E.: Berichte der Deut. chem. Gesell., 1934, lxvii., 1270.

SKIN TESTS IN WHOOPING-COUGH

To the Editor of THE LANCET

SIR,—In your last issue Drs. Paterson, Bailey, and Waller describe a skin test, using Sauer's vaccine, designed to show susceptibility to, or immunity from, whooping-cough. At Dr. Paterson's suggestion I have been using the same test on children in the wards of the Hospital for Sick Children, with results similar to theirs. So far 105 children have been tested, of whom 53 had had whooping-cough, and 52 had apparently never had it. Of the 53 who had had it, 52 (98 per cent.) gave positive reactions, while of the 52 who had never had it, 19 (27 per cent.) reacted positively, and 33 (63 per cent.) negatively.

Abortive and subclinical infections are common in other infectious fevers, so it is not surprising that 27 per cent. of those who denied ever having had whooping-cough should give positive tests. With this in view, the histories of 18 of the 19 children were probed into more deeply. (*a*) Two had never had a cough. (*b*) Five gave histories of having had "bad bronchitis" lasting 1–2 months, but their coughs were not spasmodic, not worse *at night*, and not associated with sickness. (*c*) Eleven had had coughs that were suggestive of *attacks of whooping-cough* without the whoop. The following are examples:—

1. A boy, aged 2½, whose brothers had had whooping-cough last year. At the same time he had had a cough, occurring *in spasms which were worst at night and left him red in* the face. He retched, but was not sick. The cough lasted only 2–3 weeks, and he never whooped.

2. A girl, aged 5½, had a severe spasmodic cough 1½ years ago, which was worse at night. She was often sick at the end of a fit of coughing, but never whooped. The cough lasted only 7–10 days.

Histories such as these afford grounds for believing that the children had had abortive attacks of whooping-cough; but this can never be more than a supposition, *until it* can be proved that they do not develop the disease when exposed to infection.

The criteria employed were the same as those used by Dr. Paterson and his collaborators—i.e., the test was not considered positive unless the area of erythema was larger than 1 cm. The test was read at the end of 24 hours. It must be admitted that about 10 of those who had had pertussis gave tests which were only just positive, but I think that this was due to using an insufficient dose (0·05 c.cm.). Equivocal results were not obtained when 0·1 c.cm. was injected. The only case which gave a negative test with a positive history was a boy with acute nephritis, uræmia, and gross œdema, who died a fortnight later.

These results and those of Dr. Paterson do not agree with those of earlier workers. Orgel (Arch. of Pediat., 1929, xlvi., 149) tested 1050 children, and found that 82 per cent. of those with pertussis, 52 per cent. of those who had had it, and 9 per cent. of those who had never had it reacted positively. He concluded that the test was not diagnostic. The discrepancy between the results is probably due to the greater potency of Sauer's vaccine, and to the higher concentration of bacilli used (10,000 million in Sauer's vaccine against 2000 million per c.cm. in that used by Orgel).

I am, Sir, yours faithfully,

B. MCARDLE.

Hospital for Sick Children, Great Ormond-street, W.C.,
August 19th.

NEUROSIS AND UNEMPLOYMENT

To the Editor of THE LANCET

SIR,—In an article by Dr. Aubrey Lewis in your issue of August 10th (p. 293), on which you commented in the same issue, the results of an investigation into the case-histories of 52 men referred to a psychiatric clinic by the public assistance committee are given. Dr. Lewis concludes that their unemployment is only one of a recurring series of factors which have precipitated a breakdown in individuals already predisposed to some form of neurosis. He points out the necessity of obtaining a series of men previously stable and well adapted to test the almost universal impression that unemployment is in itself a major ætiological factor in mental illness.

The figures I have collected during the year 1934 may be of some interest in this connexion. From Jan. 1st to Dec. 31st, 1934, there were admitted to the Notts County Mental Hospital 91 male patients of whom 14 were unemployed prior to admission. All these 14 patients had at some time or other been employed and their unemployment had varied from three months to several years. Of these 14, 7 were schizophrenics of whom, apart from one case, it was impossible to form a judgment as to whether the unemployment was an ætiological factor; one had general paralysis, and one was a high-grade defective. The remaining five had manic-depressive forms of insanity and in each case there existed other factors in the history, such as the death of a father, domestic trouble, privation, sufficient to render it difficult to decide which was the precipitating factor. However, in all these five, and in one of the schizophrenics mentioned above, the unemployment was judged to be a major factor. In all six cases there was no history of previous breakdown or neurosis with the exception of the one schizophrenic who was a nystagmus subject. An inquiry into their previous personality yielded nothing definite. The five manic-depressive patients were able to go home; they had proved themselves cheerful and willing workers and in no way gave the impression of being chronic social problems.

The county population from which these admissions were drawn is 448,500.

I am, Sir, yours faithfully,

Radcliffe-on-Trent, August 14th. H. A. PALMER.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—A few years ago a distinguished surgeon from the North of England invited opinions in one of the medical journals upon a condition which appears to be identical with "proctalgia fugax." I have been expecting some reference to the former discussion in the correspondence to which you have recently opened your columns; for judging by the number of communications on that occasion, the condition is by no means uncommon. I myself have had the opportunity to observe the symptomatology in a near relative for over twenty years. I had never been able to discover any references in the literature which had any bearing upon what was so elusive a peculiarity and at one time I wrote to seek assistance from continental confrères, to receive the superfluous reminder that rectal crises must not be forgotten, a reminder which has, I see, been echoed by one of your correspondents in a recent issue.

But during the last few years I have been surprised to gleam from conversations with colleagues that many of them were themselves sufferers in greater or less degree; and I notice that Dr. John Ryle has made the same discovery. The symptoms have not been universal but they have many features in common, and include the majority of those displayed by my relative who has had perhaps a hundred attacks during the period of my observation. It appears that the complaint, although not unknown in females, is very much commoner in males, and that attacks generally occur in the early hours of the morning. The sufferer is awakened by a sensation of discomfort in the rectum, which generally develops into pain extending throughout the perineum and compelling him to rise and seek relief.

The degree of pain is very variable. In its most severe form it is described as an agonising cramp which persists for a quarter of an hour but rarely longer, and gradually subsides. With the resulting relief the sufferer speedily falls asleep. Any accompanying symptoms of sweating, vomiting, collapse, or fainting would appear to be the direct result of pain rather than of any other features of a "syndrome."

The methods described to procure relief by different sufferers have been: attempt to defæcate—occasionally a small motion is passed, a hot bath, an enema, inflation of the rectum with air from a syringe, the insertion of various suppositories, all of which clearly aim at relaxation of sphincteric spasm. One physician admitted that he had on occasion been driven to a hypodermic injection of morphia. Mr. Lockhart Mummery has informed me that he was quite familiar with the complaint. He regarded it as a tic, and added that he had often found hypersensitiveness of the sacral plexus in such subjects on digital examination of the rectum—this was not present in my relative's case—and that injection of the plexus with absolute alcohol was often useful. He was further of the opinion that there must be some local occurrence—e.g., the presence of a foreign body—to activate the process.

Dr. Ryle regards fatigue as an exciting factor. At one time I thought this a likely explanation as attacks in my relative occurred in the night following strenuous exercise. But such a relationship was by no means constant nor in fact was any convincing explanation forthcoming. If however we accept Dr. Ryle's description of it as a visceral neurosis, it is easy to understand how a little extra fatigue, mental or physical, would be quite sufficient in the case of what after all must be a highly predisposed subject. I am, Sir, yours faithfully,

ADOLPHE ABRAHAMS.

Brook-street, W., August 16th.

To the Editor of THE LANCET

SIR,—I was much interested in Dr. Hess Thaysen's article about this strange "proctalgia fugax," because it is the first description I have seen of this most distressing rectal pain. For four years I have had under my care a woman of about 40 with this kind of pain. Sudden and very sharp, it usually awakens her at night, becomes more and more severe and, from a precise point 12 cm. above the anus, radiates into the entire pelvic region, giving an impression of intense cramp in the uterus. The attack lasts a few minutes and then disappears, leaving the patient very tired. This patient has been operated on many times; she has had colitis and hæmorrhoids, and has suffered different kinds of pelvic and rectal pains; and she is sure that this neuralgia is entirely independent of the state of her colon and hæmorrhoids. The attacks always occur just before or after the monthly periods. They seem to be more frequent when she lies on a hard bed; the first attack came on when she had been some weeks in a clinic where her bed was too hard.

Sometimes the patient feels the attack is coming and she can then control it with a suppository of Cibalgine. After examination by a neurologist and by a gynæcologist who could find no cause for the pain, she had a few sittings of short-wave diathermy of the pelvi-rectal region; this was six months ago and she has had only a single mild attack since.

I am, Sir, yours faithfully,

Lausanne, Switzerland, August 15th. R. M. TECON.

"LIFE WITHOUT BREATHING"

To the Editor of THE LANCET

SIR,—The annotation under this heading in your last issue reminds me of some, as yet unpublished, experiments I performed at the Lister Institute in 1922. Oxygen injected into the veins at ordinary atmospheric pressure generally does more harm than good, by filling the right heart with froth. I therefore made an apparatus by means of which I could deliver oxygen at a pressure between 200 and 250 mm. Hg, at any required rate. Using a small branch of the femoral artery as a cannula, I injected an average of 10 c.cm. per minute into the femoral artery of an anæsthetised dog. The idea was to use the capillaries of the leg as a lung, and for splitting up the oxygen into very fine bubbles. No apparent harm resulted to the dog, and it continued to make regular respiratory movements in spite of the fact that O_2 was entirely withheld. After two hours of life under these conditions the dog was killed.

This experiment was repeated, both in dogs and cats, but the result was never again so entirely successful, twenty minutes being the limit of survival when breathing N_2 only. Possibly a combination of Singh's methods and mine might be the best means of artificial aeration of the blood.

I am, Sir, yours faithfully,

Whitechapel, E., August 16th. THOMAS LUMSDEN.

THROMBO-ANGIITIS OBLITERANS

To the Editor of THE LANCET

SIR,—The case of thrombo-angiitis obliterans following gassing recorded by Dr. McDougall and Dr. Crawford in your last issue was of special interest to me because the notes of the case were submitted to me by a solicitor accompanied by a request to support the claim for a pension. Having seen some number of cases of Buerger's disease in none of which a history of gassing was obtained, and having had under my care many patients who gave histories of gassing none of whom had developed thrombo-angiitis obliterans, and also in the absence of any cases recorded, I replied that I regretted that I was unable to comply with the request. Dr. McDougall and Dr. Crawford are very persuasive in their able paper; but is it safe to conclude from a single case that some preceding condition is an ætiological factor? It would be of interest to learn from those who have seen many cases of Buerger's disease from what percentage a history of gassing can be extracted, and from those who have seen many cases of gassing in what percentage thrombo-angiitis obliterans has developed.

I am, Sir, yours faithfully,

Portland-place, W., August 20th. O. LEYTON.

PANEL AND CONTRACT PRACTICE

Wanted a Definition of Assistant

THE London insurance committee is still in difficulty how to define an assistant in those cases where a practitioner is permitted, by virtue of his having obtained the committee's consent to the employment of an assistant, to accept a greater number of insured persons than is allowed to a practitioner working single-handed.

Dr. A. had employed an assistant, Dr. B., for a number of years, and on Dr. B.'s death Dr. C. was appointed in his stead. The committee found, however, that Dr. C.'s name was already included in their medical list in respect of a practice situate near the boundary of the county, some six miles distant as the crow flies, where he had a few insured persons included in his London list and others in his list for the adjacent area. Inquiries being sent to Dr. C., it was found that he was absent from the practice owing to illness. He was asked as to the arrangements made for his own practice during his absence and he replied that he desired to transfer the insured persons included in his own list to that of his principal, Dr. A. The question then arose whether the amount of assistance which was being given to Dr. A. was sufficient, having regard to the somewhat large excess of acceptances over the limit applying to a practitioner working single-handed. Clearly while Dr. C. had had a responsibility for his own practice he had not been able to give full-time assistance to Dr. A. nor had Dr. A. had a first call upon his services. In March, 1930, a report was submitted by the medical service subcommittee which contained the following statement:—

> There nowhere appears either in the terms of service or the allocation scheme any indication as to the extent to which an assistant should be employed by a practitioner. We are aware, however, that the committee have laid it down that if a practitioner is required to employ an assistant by virtue of the number of insured persons on his list, such assistant should be a whole-time assistant. If the term "whole-time" is to be taken as connoting that an assistant must be actually in the practice for the whole of his time, it is clear that this will operate unequally, as between the case of a practitioner who exceeds the maximum number by the full quota—namely, 1500—and the case of a practitioner whose list is in excess by only a small number. It appears to us that the extent to which a practitioner employs an assistant is primarily a matter for determination by the practitioner, but he must have reasonable regard to the circumstances of the practice. The matter is not, in our view, free from difficulty, but we consider, in the absence from the regulations of any precise definition, that the spirit of the requirement is met if a practitioner has a bona-fide arrangement with a salaried assistant whereby he has the first call on the services of that assistant. Any such arrangement should, of course, be such as to secure continuity in the employment of an assistant, and an assistant should not be in a position to discontinue his service with the practitioner by whom he is employed without proper notice. It follows as a corollary to the foregoing that, if it were established to our satisfaction in any case that a practitioner had not taken all the steps reasonably open to him to secure continuity of employment of an assistant and had not bona fide employed an assistant continuously in his practice, we should have no alternative but to regard it as a failure on his part to observe the conditions governing the con-

sent to the employment of an assistant and to recommend that a portion of the extra remuneration which he secures by virtue of the employment of an assistant should be withheld from him, the amount withheld being dependent upon a consideration of the whole of the circumstances and not merely upon an arithmetical calculation.

The subcommittee referred also to a report submitted in July, 1933, wherein it expressed the view that the concession enabling a practitioner to accept an increased number of insured persons owing to his employing an assistant presumed that the two practitioners would be working concurrently. The insurance committee decided that the whole question of the definition of an assistant where a practitioner is required to employ an assistant required examination, the circumstances of the case above cited being a demonstration of the necessity. It is accordingly consulting with the local medical and panel committee with a view to the withdrawal of consent from Dr. A. to employ an assistant. This will enable the whole situation to be examined and it is to be hoped that a proper definition of what constitutes an assistant may be forthcoming.

An Appeal

Except in certain prescribed circumstances an insurance practitioner is not permitted to demand or accept any fee or other remuneration in respect of treatment which he is required to give under his terms of service, and further he may not charge an insured person for specialist treatment unless he proves not only that the service is of a specialist nature but also that he is properly qualified to give the treatment. The wording of Clause 10 seems clear enough and yet it not infrequently happens that a doctor, having charged as he thinks properly, is called upon to defend his action. For instance, a doctor, who had been treating an insured person for chilblains, on six occasions applied ultra-violet radiation for which he received 12*s*. The condition of the patient did not yield to the treatment, and the doctor then advised her to apply for further treatment at a hospital in London. He was invited by the insurance committee to complete form G.P.45 in order that the propriety of his charge might be tested, but he replied that it had been made clear to the patient that the "apparatus and treatment for her condition" was the affair of a certain Mr. X., assistant radiologist to the Y Hospital. As the patient could not attend during the hours when Mr. X. was available he applied the treatment on Mr. X.'s behalf, the fees being those he would have charged himself. The doctor accordingly expressed himself as unable to complete form G.P.45. It seems that the doctor and Mr. X. had entered into an agreement some sixteen months earlier whereby Mr. X. had the use of the doctor's professional room two hours every afternoon for the purpose of giving radiation treatment. The doctor having himself applied the treatment in this case retained the fees as a set-off against the rent payable by Mr. X. Unfortunately Mr. X. was not all that he should be, for in connexion with other proceedings it was reported that he had claimed to be a doctor, had professed to have had experience as a radiologist in the army, and to have had radiology experience at the hospital, all of which had been proved to be false. The medical service subcommittee took a serious light of the transaction. The doctor's knowledge of the possibility of ray treatment being regarded as forming part of his terms of service (he admitted having had this possibility brought to his notice some time ago in another area) led to the inference that he had endeavoured to divest himself of his responsibilities as an insurance doctor on the ground that the apparatus used by him for the treatment of his patient belonged to some other person. The committee proposed a refund of the 12*s*. to the insured person and recommended the Minister to deduct £10 from his remuneration. The committee decided also to ask the Minister to lay before the General Medical Council the facts of the doctor's association with an unqualified person. It is understood that the doctor has appealed against the committee's decision.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. L. Warren, O.B.E., to *St. Angelo* for R. N. Hospl., Malta, and promoted to rank of Surg. Rear-Admiral.

Surg. Rear-Admiral H. R. H. Denny, C.B., placed on the Retd. List at own request.

Surg. Comdr. W. G. Thwaytes placed on the Retd. List at own request, with rank of Surg. Capt.

Surg. Lt.-Comdr. V. G. Horan to *President* for course.

Surg. Lt.-Comdr. J. L. Malone to *Delhi* (on transfer of flag).

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. H. Parry-Price and Surg. Lt.-Comdr. H. M. Petty to *Victory* for R.N. Hospl., Haslar.

Surg. Lts. D. R. Hughes and W. H. C. Watson to *Neptune* and A. Elliott to *Rodney*.

Surg. Lt. E. R. G. Passe, promoted to Surg. Lt.-Comdr.

ARMY MEDICAL SERVICES

The War Office announces that Col. H. H. A. Emerson, commandant and chief instructor at the Army School of Hygiene, Aldershot, has been selected for appointment as director of hygiene at the War Office with effect from Oct. 6th, 1935, in succession to Maj.-Gen. P. H. Henderson, C.B., honorary physician to the King, who will vacate the appointment on completion of four years' service as a major-general. Lt-Col. A. C. Hammond-Searle, assistant director of hygiene at the War Office, has been selected to succeed Col. Emerson as commandant at the Army School. His successor at the War Office will be Lt.-Col. D. T. Richardson, R.A.M.C.

ROYAL ARMY MEDICAL CORPS

Short Serv. Commissions.—Lt. H. V. D'A. Iles to be Capt.

TERRITORIAL ARMY

Lt.-Col. and Bt.-Col. E. A. C. Fazan, M.C., T.D., from R.A.M.C., Gen. List, to be Col. June 29th, 1935, with seniority Feb. 16th, 1934. (Substituted for the notification in the *Gazette* of June 28th, 1935, *vide* THE LANCET, July 6th, p. 44).

Lt-Col. J. A. Stenhouse, T.D., to be Bt.-Col.

Capt. H. Watson resigns his commn.

The King has conferred the Territorial Decoration upon the undermentioned Officer under the terms of the Royal Warrant dated Oct. 13th, 1920: Lt.-Col. Edward Hillis Marshall, D.S.O. (ret.).

Maj. I. H. Lloyd-Williams, M.C., from T. A. Res. of Off., to be Maj.

Lts. E. H. Jaques and D. Campbell to be Capts.

Lt. Walter Heard, late M.G.C., to be Lt.

ROYAL AIR FORCE

Wing Comdrs. J. T. T. Forbes to Central Flying School, Wittering, for duty as Medical Officer, and W. E. Hodgins to Home Aircraft Depot, Henlow, for duty as Medical Officer.

Squadron Leader W. E. Barnes to Princess Mary's R.A.F. Hospital, Halton, for duty as Medical Officer.

Flight Lts. N. I. Smith to No. 2 Flying Training School, Digby, and V. H. Tompkins to No. 20 (Army Coöperation) Squadron, Peshawar, India.

INDIAN MEDICAL SERVICE

Capt. A. Tait to be Maj. (provl.).

Lt.-Col. G. Holroyd has retired.

MEDICAL NEWS

University of Dublin

A post-graduate course will be held at Trinity College from Sept. 16th to Oct. 5th. It will consist of clinical instruction, formal lectures, and laboratory work. Further particulars may be had from the dean of the faculty of physic, Trinity College, Dublin.

Victor Horsley Lecture

The fifth Victor Horsley memorial lecture will be delivered by Sir Walter Langdon-Brown, regius professor of physic in the University of Cambridge, in the lecture theatre of University College Hospital medical school, on Tuesday, Nov. 19th, at 5 P.M. The title is the Integration of the Endocrine System and the chair will be taken by Sir Gowland Hopkins, O.M.

Medical Society of London

The programme for the first half of the 163rd session of this society opens with the annual general meeting at 8 P.M. on Monday, Oct. 21st, after which, at 8.30 P.M., Prof. G. E. Gask will give his presidential address, entitled Changing Surgery. Dates and subjects for the Monday evening discussions are as follows: Oct. 28th, electrical injuries (to be introduced by Dr. Macdonald Critchley and Dr. John Aydon); Nov. 25th, the use and abuse of insulin (Dr. R. D. Lawrence and Dr. George Graham); and Dec. 9th, the care and treatment of difficult children (Dr. Reginald Miller and Dr. William Moodie). On Nov. 11th there will be a clinical meeting. The Lettsomian lectures for 1936 will be given by Dr. P. H. Manson-Bahr on Feb. 17th, 26th, and March 2nd, his subject being the differential diagnosis of diseases of the colon (dysentery and colitis) and their complications, with special reference to treatment. Sir James Walton will deliver the annual oration. The address of the society is 11, Chandos-street, W.1.

Tomarkin Foundation

The seventh international medical post-graduate congress of this foundation will be held in two sections this year. From Sept. 12th–19th the congress will meet in Brussels, where the first session in which the International Union Against Cancer is coöperating is to be in honour of Pierre and Marie Curie and will deal with cancer. Mr. and Mme Joliot-Curie are to be among the speakers. Discussions on tropical, subtropical, and infectious diseases will be held under the presidency of Sir Aldo Castellani, and other speakers will include Dr. W. Levinthal and Prof. C. Levaditi. At another meeting a delegation of Italian neurologists will give a symposium on recent advances in the treatment of post-encephalitic parkinsonism. From Sept. 20th to Oct. 2nd the congress will meet at Spa where diseases of the cardiovascular system will be discussed; the speakers will include Sir Crisp English, Sir Harold Gillies, and Prof. J. Plesch. At a session on diseases of the blood Prof. U. Friedemann will read a paper on the blood-brain barrier. After the congress a visit to the principal Italian universities has been organised. Further information may be had from the secretary of the foundation, 97, Rue aux Laines, Brussels.

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Mental Hospital.—Asst. Physician. £300.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

All Saints' Hospital for Genito-Urinary Diseases, Austral-street, S.E.—Res. H.S. At rate of £100–£150.

Birkenhead Municipal Hospital.—Sen. Res. M.O. £350. Also Res. M.O. £300.

Blackburn County Borough.—Asst. M.O.H. £600.

Blackburn Royal Infirmary.—H.S. £175.

Board of Control, Rampton State Institution for Mental Defectives, nr. Retford.—Deputy Med. Supt. £847. M.O. £515.

Bristol, City and County of.—Asst. M.O.H. £500.

British Postgraduate Medical School, Ducane-road, Shepherd's Bush, W.—Cas. O.'s. At rate of £150. Also H.P.'s and H.S.'s.

Burton-on-Trent General Infirmary.—H.S. £150.

Cardiff Royal Infirmary.—H.P.'s and H.S.'s. At rate of £50. Also H.S. to Ear, Nose, and Throat Dept. At rate of £100.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. £120 and £100 respectively.

Chester Royal Infirmary.—H.S. for Special Depts. £150.

Chichester, West Sussex County Mental Hospital.—Third Asst. M.O. £350.

Coventry and [illegible] Res. Surg. O. £200.

Denbighshire [illegible] [illegible]I.O.H., &c. £1100.

Dewsbury and [illegible]—Sen. H.S. £200.

Doncaster Ro[illegible] [illegible]ye and Ear, Nose and Throat Depts. £175.

Doncaster Royal Infirmary and Dispensary.—Sen. Res. £250. Also Res. Anæsthetist. At rate of £175.

Dreadnought Hospital, Greenwich, S.E.—Receiving Room Officer and H.P. At rate of £200 and £110 respectively. Also H.S. At rate of £110.

Dudley, Guest Hospital.—H.S. and Second H.S. £200 and £170 respectively.

Dumfries and Galloway Royal Infirmary.—Supt. £500.

East Ham Memorial Hospital.—Pathologist. £300.

Epsom County Hospital.—Res. Asst. M.O. At rate of £250.

[illegible] *Borough.*—Jun. Asst. Maternity and [illegible] £500.

[illegible] *Ducane-road, W.*—Asst. Radiologist. [illegible]

Harrogate and District General Hospital.—H.P. and Cas. O. Also H.S. Each at rate of £150.

Herefordshire General Hospital.—H.S. and Cas. O. £100. Also H.P. £100.

Huddersfield, Mill Hill Isolation Hospital.—Res. M.O. £350.

Huddersfield, St. Luke's Hospital.—Res. M.O. £200.

Hull, Anlaby-road Institution.—Asst. M.O. £350.

Kingston and District Hospital.—Visiting Physician. £300. Also Visiting Aural S., Orthopædic S., and Neurologist.

L.C.C. Public Health Dept.—Social Workers for Special Hospitals. Each £235.

Leamington Spa, Warneford General Hospital.—Res. H.S. to Cas., &c., Dept. At rate of £150.

Leicester City Mental Hospital, Humberstone.—Third Asst. Res. M.O. £350.

Leicester County Sanatorium and Isolation Hospital, Markfield.—Res. M.O. £400.

Leicester Royal Infirmary.—H.S.'s, Cas. O., H.P.'s, Jun. Res. Anæsthetist. Each at rate of £125. Also Jun. Cas. O. At rate of £100.

Liverpool Heart Hospital.—H.P. At rate of £100.

Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt. £200.

Liverpool Women's Hospital, Catharine-street.—H.S. At rate of £100

Macclesfield General Infirmary.—Second H.S. £150.

Manchester, Christie Hospital and Holt Radium Institute.—Asst. Radium Registrar. £400–£500.

Manchester, Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. Each at rate of £150.

Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.—Pathologist.

Middlesbrough, North Riding Infirmary.—Third H.S. £125.

Miller General Hospital, Greenwich-road, S.E.—Two Cas. O.'s. Also Out-patient Officer. Each at rate of £150. Also H.P. and H.S. Each at rate of £100.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. or H.S. At rate of £100.

Northern Ireland Ministry of Labour.—M.O. £738 12*s.*

Northumberland County.—Sen. Tuber. O. £800.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Norwich, Norfolk and Norwich Hospital.—H.S. to Surg. Out-patient Dept. £200.

Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. Also Cas. O. Each at rate of £150.

Plymouth, Prince of Wales's. Hospital, Lockyer-street.—H.S. At rate of £150.

Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.

Preston and County of Lancaster Royal Infirmary.—H.P. At rate of £150.

Prince of Wales's General Hospital, N.—Hon. Surg. Reg. to Ear, Nose, and Throat Dept. £100. Also Jun. H.P. and two Jun. H.S.'s. Each at rate of £90.

Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100.

Rotherham Hospital.—Cas. H.S. £150.

Royal Eye Hospital, St. George's-circus, Southwark, S.E.—H.S. and Asst. H.S. At rate of £150 and £100 respectively.

Royal National Orthopædic Hospital, Gt. Portland-street, W.—Two H.S.'s (one for Country Branch). Each at rate of £150.

St. Helens County Borough.—Asst. M.O.H. £500.

St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

Sheffield Royal Infirmary.—Second Asst. Cas. O. At rate of £80.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. At rate of £150.

Surrey County Council.—Asst. M.O. £600.

Tilbury Hospital, Essex.—H.S. At rate of £140.

Weir Hospital, Grove-road, Balham, S.W.—Sen. Res. M.O. £200. Jun. Res. M.O. £150.

West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.

Windsor, King Edward VII. Hospital.—H.S. At rate of £100.

[illegible] *Royal Hospital.*—H.S. for Fracture and [illegible] At rate of £100.

[illegible] *War Memorial Hospital, Shooter's Hill, S.E.*—Res. M.O. £175.

Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

York Dispensary.—Res. M.O. £175.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Ruthin, Denbigh.

NOTES, COMMENTS, AND ABSTRACTS

WILLIAM STARK, M.D.

AN EIGHTEENTH CENTURY EXPERIMENT IN NUTRITION

BY J. C. DRUMMOND, D.Sc.
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ANNE WILBRAHAM
(From the Department of Biochemistry, University College, London)

AT 4 P.M. on the afternoon of Friday, Feb. 23rd 1770, a rather remarkable young medical man William Stark, died in London. For some time he had been experimenting on himself with great perseverance with the object of studying the effect of different types of foods on health. The pages of his meticulously recorded journal show all too clearly why he came to so untimely an end. His work is curiously little known. Indeed, the only reference to it which we have found is in Graham Lusk's short and scholarly "History of Metabolism," itself a work known to comparatively few.

Sources of Information

The manuscript notes of Stark's experiments, together with a number of highly interesting and carefully compiled anatomical and clinical observations, passed after his death into the hands of the Hon. Thomas Fitzmaurice, who appears to have acted in some way as the young man's patron. Fitzmaurice obviously thought the records worthy of publication, for he sought an editor. Dr. James Carmichael Smyth, of the Middlesex Hospital, physician extraordinary to King George III., accepted the task and the volume appeared in 1788. Smyth's preface gives a brief concise biography of young Stark, to which we are now able to add a few details. Generally speaking, however, our search for information about his life has proved disappointing.

The first record of him is in the Matriculation Album of Glasgow University where he matriculated in 1753. He is there described as "Gulielmus Stark filius natu maximus Thomae Stark mercatoris in Urbe Manchester." This record also states that he was born in Birmingham in July, 1740, but we have not been successful in tracing a baptismal or other entry in that city. One imagines that at Glasgow he came under the influence of that great teacher William Cullen, for after taking his M.A. there in 1758 he moved to Edinburgh to study medicine. Cullen, appointed to the Chair of Chemistry at Edinburgh in 1755, had begun his famous series of clinical lectures at the infirmary there in 1757. A few years earlier Black, another of Cullen's students in Glasgow, had also moved to Edinburgh to study medicine, and subsequently published his inaugural dissertation "De humore Acido a Cibis Orto, et Magnesia Alba," which marks the birth of modern chemistry.

His Move to London

Stark did not take a degree at Edinburgh. He decided to move to London and to work with John Hunter so that he could continue the anatomical studies in which his interest had been so deeply aroused by Monroe. He came south in 1765. Probably even at that time he hoped to be appointed to the staff of St. George's Hospital, for in the Minute Book of the Hospital we read that on March 19th, 1766, the clerk paid in "a subscription of five guineas from William Stark, a new subscriber, to Lady Day, 1767." Mr. R. R. James, F.R.C.S., an authority on the history of St. George's and its medical school, informs us that this payment probably made Stark a governor, and that at that time it was customary for those who aimed at a post on the honorary staff to become governors in order to increase their chances of success. Both Gataker and John Hunter appear to have taken this precaution.

After the first entry there is a long series of records of Stark's attendance at the weekly board meetings and general quarterly courts of the Hospital. His last attendance was apparently on Jan. 17th, 1770, a month before his death. One or two of these entries are of interest, for they tell us that he was on more than one occasion appointed to the Committee which had the task of auditing the accounts for the year and "settling the annual list and the gratuities to the servants." He was also present at the Special General Court held on Dec. 9th, 1768, when John Hunter was elected surgeon. A month later came the opportunity for which he had doubtless been waiting. A physician, Dr. Jebb, retired from the staff and his successor was to be appointed. The Quarterly General Court met on Jan. 6th, 1769. The name of Dr. Richard Wright was proposed by Sir Clifton Wintringham. Stark was present and his name was brought forward by John Drummond. The committee proceeded to take a vote, "the ballot being kept open until 2 o'clock in the afternoon." Wright was elected by 111 votes to 39.

Almost a year later another chance occurred. Dr. Wilkinson Blanshard died and the Yearly General Court was asked to select a physician in his place. At this time Stark was occupied with his experiments on diet and was, as a result, rapidly undermining his health. In his Journal for January, 1770, we read: "Having since the 5th been engaged in a canvas for St. George's Hospital, I have been rather irregular in respect to diet, living rather more freely, and drinking more wine than usual." On the 19th his hopes were failing, for he wrote: "I was still low-spirited and dull, but this was, possibly, in part, owing to my having small hopes of success at St. George's Hospital." On Feb. 2nd the court elected Dr. Petit to the vacancy.

Of Stark's three years of life in London we know practically nothing. His journal gives us fleeting glimpses which seem to show a quiet, retiring and rather serious-minded individual. Almost certainly he was a bachelor. In describing his dietetic experiments he speaks first of getting his meals in from an eating house and later of cooking them himself in a double saucepan which he devised for the purpose. His name does not appear in the London Register of Marriages for the years in question, and, moreover, there is no suggestion in the pages of his journal that he had a wife. His circle of friends is of particular interest, because of the influence which some of them appear to have had on his work. When he was first in London his interests were those which clearly had been aroused during student days by Cullen and Monroe—namely, chemistry and morbid anatomy. Of the former Smyth remarks:

> "Whilst attending the hospital, he was also employed in making experiments on the blood and other animal fluids; and likewise in a course of experiments in chemical pharmacy, which are still extant; and give the strongest evidence of his accuracy and diligence; but whether they are of importance enough to be presented to the public, I have not yet had leisure to ascertain."

Contact with Sir John Pringle

So far as we know these notes have not appeared in print and the whereabouts of this MS., as well as of the main part of Stark's published work, if indeed they have been preserved, is not known. A number of his studies in morbid anatomy are fully set out in the first section of Smyth's compilation. In every detail they reveal the mind of a keen, observant and well-trained investigator. Whilst in London Stark met and became a friend of Sir John Pringle. It may have been this contact that led him to present a thesis at Leyden, for Pringle had been educated there. At any rate Stark registered at the University on Sept. 2nd, 1766, and a little more than a fortnight later was promoted to his doctorate in medicine for a thesis entitled "Specimen Med. Inaug. septem Historias et Dissectiones Dysentericarum exhibens."

About this time another friendship was made, and there are reasons for thinking that from this arose the remarkable diversion of interests that led to the experiments on diet being planned. Benjamin Franklin was in England from 1764 to 1775, and he and Stark became acquainted. The American doctor had for long been interested in the function of foods. He held a brief for the simple life: "If thou art dull and heavy after meat it is a sign that thou hast exceeded due measure; for Meat and Drink ought to refresh the Body and make it cheerful and not to dull or oppress it." He told Stark that when a journeyman printer he had lived a fortnight on bread and water, at the rate of 10 lb. of bread per week, and found himself stout and hearty on the diet.

Stark's curiosity was aroused. He consulted his colleagues. Sir John Pringle told him of Greeks who lived wholly on currants and of a more astonishing case of an old lady of 90 whose sole sustenance was mutton fat! Hewson, then lecturer at William Hunter's school, contributed a second-hand story of sailors living solely on tobacco or sugar; the latter dying of scurvy, the former living in health. And so from his friends and colleagues he gathered an ill-assorted collection of observations—and a tall story or two—about curious diets and digestion in the human stomach.

It is clear from his introduction to the description of the experiments on diet that the main task Stark set himself was to decide by direct experiment whether very simple diets, such as Franklin had advocated, were compatible with health. He remarked naïvely:

> "I confess it will afford me singular pleasure if I can prove by experiment, that a pleasant and varied diet is equally conducive to health, with a more strict and simple one; at the same time I shall endeavour to keep my mind unbiassed in my search after truth, and if a simple diet seems the most healthy I shall not hesitate to declare it."

In planning the experiment he was in some doubt whether to make observations of the excreta, for "I have sometimes doubted whether an accurate attention to the discharges of the body be not more a matter of curiosity than of use." However, he goes on to say—and one may be forgiven the suspicion that he had an eye on the possibility of a vacancy on the hospital staff:

> "If after what I have said I shall be thought to have indulged myself with attending too accurately to the discharges of the body, it must be partly imputed to my desire to avoid the appearance of entertaining a doubt that what some of the first names in Physic have thought deserving their attention were things of little moment."

Stark's First Auto-experiment

His first experiment on himself began on June 12th, 1769.* He is described as 29 years old, 12 st. 3 lb. in weight, stoutly made but not corpulent, of a florid complexion, with red hair. It is reasonable to make the assumption in the first place that, up to the time his experiments began, he had been living on an adequate and varied diet and, secondly, that he was of sedentary habits. Dr. J. R. Robertson, of the Middlesex Hospital, has very kindly provided us with an assessment of his heat output as 78·5 calories per hour, corresponding to a basal requirement of 1880 calories daily. We may, therefore, estimate his daily requirements at 3000 to 3200 calories.

Doubtless with Benjamin Franklin's experience in mind Stark's first experiment was to study the effects of a diet of bread and water. For no less than ten weeks he lived almost exclusively on bread and water, the only change being that for a period of about a fortnight he allowed himself in addition a ration of sugar. On 20 oz. of bread daily he felt hungry and lost weight, which is not surprising when it is noted that his calorie intake was well below the estimated basal requirements. When he raised his consumption of bread to 30 oz. daily his loss of weight became smaller and he stated that he felt hearty. A further increase to 38 oz. enabled him to put on a little weight and to record that his appetite was fully satisfied and that sometimes he had more than he could eat. From this we may fairly draw the conclusion that his sedentary life actually did call for about 3000 calories a day. The relationship between body-weight and calorific intake is clearly traced in the accompanying figure, Period I.

What might be the effect of this diet over a period of ten weeks? Almost certainly his bread was "wholemeal" wheaten flour—such is the assumption we have made in calculating from his records of food eaten what were his intakes of protein, fat, and carbohydrate—so that one is able to say that the defects of the diet were (i) a paucity of fat, (ii) protein of low biological value, (iii) deficiency of fat-soluble vitamins A and D, and (iv) almost complete absence of vitamin C. From present-day knowledge of diets for adults little importance is attached to the low intake of fat, whereas the amounts of wheat proteins, even at the lowest level, were in all probability sufficient for maintenance. Nor are there grounds for any great concern at a low intake of vitamins A and D by a fully grown man over a period as short as ten weeks. The same cannot be said of the shortage of vitamin C. Stark was living dangerously on a scorbutic diet.

On August 11th, two months after the experiment began, he noticed that his gums were swollen and bled easily, and that the inside of one nostril was purple and very painful. From then onwards until Sept. 5th his journal contains frequent references to symptoms all too clearly scorbutic. A certain alleviation of the condition from time to time indicates that he was suffering from a mild chronic form of the malady, and it is rather curious that apparently he did not then recognise what was wrong.

The development of definitely scorbutic symptoms in a period as short as two months is perhaps remarkable. The records of sea voyages usually indicate that at least four months would elapse before the disorder appeared. A more appropriate comparison, however, is provided by the cases described by Holst and Fröhlich in their classic paper on scurv published in 1912. In these the characteristi lesions appeared after periods of six to seven months subsistence on bread and water. A possible explanation is that Stark had been living for some tim prior to the beginning of his experiment on a di rather low in vitamin C.

On every page of his journal one reads somethin that reveals his desire for investigation and his powers of observation. Wishing to know how long food is retained in the body he marks its passage with mustard or carraway seeds. Suspecting that the activity of the salivary glands is increased during a meal, he measures it and finds "the quantity of saliva secreted in half an hour, to be, whilst the parts were at rest, four drachms, whilst eating, five ounces four drachms."

The Rigour Relaxed

It is fortunate that the plan of Stark's experiments enables us to group them conveniently for study (see Table). During the first period (June 12th to Sept. 5th) his diet was restricted to bread, water, and sugar, apart from a small amount of olive oil for one week. By early September he had lost nearly a stone of weight, his appetite had gone, and he found himself dull and listless. Scorbutic symptoms were persisting and were indeed rather more marked, and there were also clear indications of an associated intestinal disorder. He felt justified in relaxing the rigour of his self-imposed restrictions and for a few days "lived freely on animal food, milk, and wine; when I felt myself quite recovered." The records show that he put on several pounds of weight and that the condition of the sores in his mouth rapidly improved.

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* In the copy of Stark's works (1788) in the Library of University College, London, this date is incorrectly given as July 12th.

No. of exp. in Stark's Journal.	Date in 1769.	Food.	Period in text.	Remarks.
1–3	June 12th–Sept. 13th.	Bread & water.	1	Sugar taken in one experiment and olive oil in another.
4	Sept. 14th–Oct. 2nd.	—	2	Diet irregular; animal foods and milk taken.
5–9	Oct. 3rd–Nov. 25th.	Bread & meat.	3	Meats were roast goose, stewed or boiled beef.
10–15	Nov. 26th–Dec. 26th.	Flour & oils.	4	Diet consisted of puddings made with flour and various fats and oils.
16–22	Dec. 27th–Jan. 3rd, 1770.	Bread & lean or fat meat.	5	Alternate experiments, each of a few days, comparing value of lean meat with the fat.
23	Feb. 4th–Feb. 15th.	Bread & honey.	6	—

The next experiment (4) is of no particular interest. He took quite large amounts of milk, and, for a few days, meat, so that it constitutes something resembling a "control" period (2). He regained weight and his general condition improved.

The experiments 5–9 which Stark undertook from Oct. 2nd to Nov. 25th can conveniently be grouped together (Period 3). During most of this time he was living on bread and cooked meats, sometimes with added fat. For some time, until Oct. 28th, his intake was adequate to maintain his weight, and he noted that the condition of his gums was steadily improved. At the end of the month he remarked: "Being now in perfect health, and my gums apparently sound, I thought it a proper time to ascertain, by experiment, whether the affection of my gums, and the other complaints with which I had formerly been attacked, were occasioned by sugar, or were owing to my having persevered too long in a diet of bread and water." Accordingly for five days Stark returned to a diet of bread, sugar, and water, and recorded: "My gums were not in the least affected."

It seems that we can here trace the influence of Sir John Pringle's opinion on Stark's experiments, because at this period the distinguished military surgeon was inclined to differentiate between land and sea scurvy, and to hold the view that too much sugar in the diet might in part be responsible for the former disorder.

The remainder of this period is of little interest beyond the steady fall in weight caused by insufficient food; in one period he was living on less than 900 calories a day. It is not surprising that he often felt hungry, but it is interesting that he remarks on his good spirits.

A Month on "Puddings"

His next idea was to compare the nutritive value of flour with that of lean meat, and accordingly he lived for approximately a month (Period 4) on what must have been most unpalatable "puddings" which he himself compounded with flour, various oils, and water. Discovering what he took to be undigested fat in his fæces he reduced the amounts from 6 to 4 oz. He suffered with headaches on the higher intake of fat, but there is no reason to suspect ketosis as the anti-ketogenic margin of the diet appears to have been ample. Generally speaking he formed an unfavourable opinion of diets containing a lot of fat, although one suspects that in some cases he was unfair in his condemnation. Thus, for example the unfortunate consequences that followed the consumption of a quarter of a pound of butter on Dec. 15th were almost certainly due to the material being in some way unfit to eat.

Noticing that butter more frequently caused intestinal disturbances than did oil or suet, he made an interesting comparison between the fresh butter itself and the oil separated from it. The former caused colic and diarrhœa, the latter did not. One

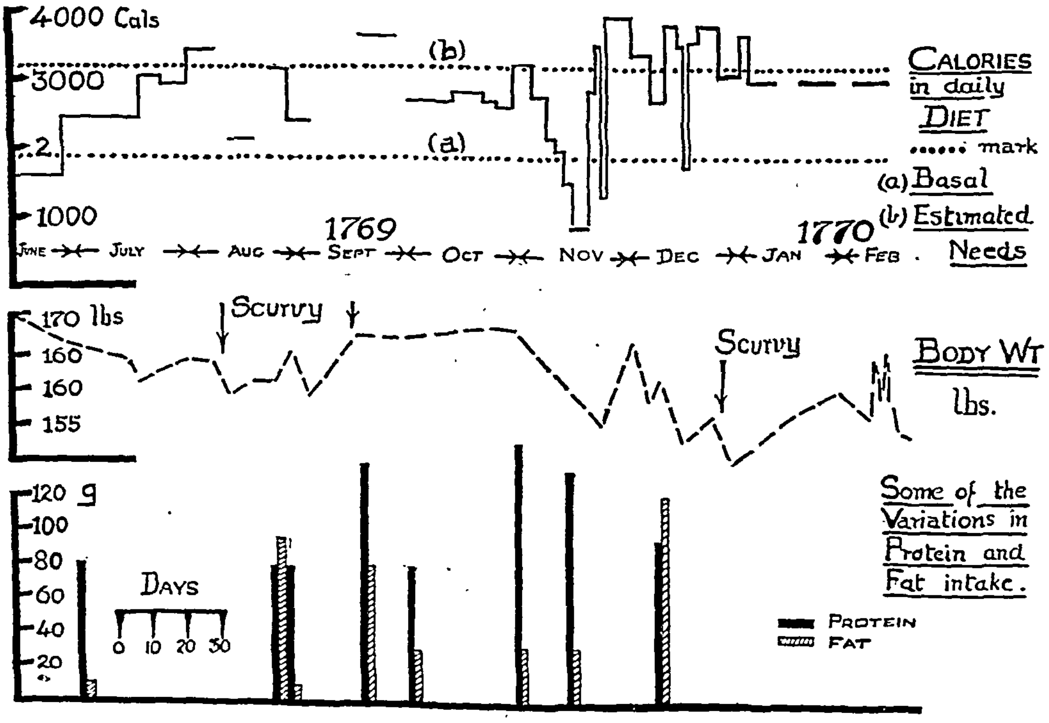

Chart showing the sequence of Stark's experiments on himself.

wonders what a bacterial examination of London milks and creams of those days would have revealed. During a good part of the time he had been living on the "flour-fat" puddings and he lacked the vigour and sense of fitness that he felt when feeding mainly on bread and meat diets. The fluctuations in his weight reflect sharply his food intake.

About this time—actually on Dec. 26th—he again noted that his gums were purple and rather swollen. The obvious scorbutic symptoms had been absent since late September when he had lived for a time on meat, milk, and other foods. If we take Oct. 2nd as the date at which unknowingly he again imposed scorbutic diets on himself—the gums apparently were normal on Oct. 14th—we find that the second onset of scurvy appeared after a period of rather less than three months.

On the evening of Dec. 26th he ate half a pint of black currants and resolved in view of the appearance of his skin and gums to change for a time his plan of living. The currants and the diet of bread and meat to which he turned seem very slightly to have improved his condition although for the next three weeks there is still frequent mention of swollen, bleeding, and septic gums. Certainly the currants did not provide a spectacular cure such as Curran (Dub. Jour. Med. Sci., 1847, vii., 83) claims to have seen following a single helping of rhubarb tart.

One observation which he made is, however, of very great interest. "Is it not probable then, that animal oils, though they nourish and increase the weight of the body, are not of themselves sufficient to prevent a morbid alteration from taking place in the blood and fluids? Whilst, on the other hand, the lean of meat, though less nutritious, is of more efficacy in preserving the fluids of the body in a sound state?" It is, of course, recognised to-day that lean meat, even after light cooking, may have a small but significant antiscorbutic value.

With the New Year he turned again to the question which several times had aroused his interest. Which was really the more nutritious, the fat or the lean of meat? He planned to live for several days first on the fat separated from the stewed meat and then for another short period on the residual meat itself. The records of the former trial are shown in Experiments 18, 19, and 21, and the corresponding "meat" experiments are 17, 20, and 22. Throughout this experiment his calorie intake was about adequate, and he slowly regained some weight in spite of digestive disturbances—which he was inclined to attribute to rancidity—when taking a lot of fat. Again he was inclined to feel dull and depressed on the high-fat diets.

A Fatal Change of Plan

And now occurred a change of plans which probably cost him his life. Originally he had intended to follow the experiments on the relative values of the fat and lean of meat by an investigation into the effect of greens and fresh fruit. Had he done so his chronic scurvy would have disappeared and his health might have so greatly improved as to enable him to withstand the intestinal infection which he appears to have contracted about this time. He does not say why he changed his mind, but the fact remains that he turned to study the food value of honey pudding and Cheshire cheese.

The intestinal disorder became progressively worse and the scorbutic symptoms more pronounced. From Feb. 14th his journal shows that his condition was becoming rapidly more serious, and after the 18th the entries cease. Even on that day, desperately ill as he undoubtedly was, he had not lost his interest in the experiment and almost the last words he wrote were: "Suspecting that my present complaints might possibly arise, in part, from the cheese, I this day omitted it."

His colleague Hewson was called in the same day to bleed him and attended him until his death on Friday, the 23rd. Attached to the published account of Stark's experiments is one account of his illness and death written by Hewson and another believed to have been recorded at the time by Sir John Pringle. There is also an account of the findings at the post-mortem examination which was carried out the following Sunday by Hunter, assisted by Hewson.[2] Stark's death was registered at St. George's, Hanover-square, but no grave or memorial has been traced.

Did Stark Realise He Had Scurvy?

To the student of nutrition the chief interest of Stark's extraordinary series of experiments must be the light they throw on human scurvy. The first symptoms were noted after he had been living for just over two months on what we recognise to-day to have been a thoroughly bad scorbutic diet. As we have remarked before, this relatively early appearance suggests that for some considerable time before his experiments began his diet had been deficient in ascorbic acid. To some extent this view is supported by what we know of the foods he ate when he tried to improve his condition by relaxing his regimen somewhat. Milk, meat, and wine might be taken but fruit and vegetables are but rarely mentioned. It is not surprising, therefore, to find that after a period on milk and meat, during which the visible lesions had cleared up, the disease was still latent. It broke out again after another three months or so on a variety of diets all showing the defect of negligible vitamin-C content.

Did Stark realise he had scurvy or not? It is hard to say. Probably at first he did not, but later in his journal there are indications that he suspected his condition was scorbutic. Worried about his gums and skin he consulted Sir John Pringle, who had considerable experience of the disease and received the advice—not uncommon in those days—to omit salt from his diet. This he did but without benefit.

Pringle may or may not have known of Bachstrom's "Causam veram et primariam Scorbuti nullam aliam esse, quam abstinentiam diuturniorem a quocunque genere recentium vegetabilium" (1734), but he must have been fully aware of the views expressed by Lind, of whose classic treatise on the scurvy three editions had then appeared. It is reasonably certain, therefore, that at this date Pringle was not much influenced by Lind's work, and that he retained the older views that too much salt and sometimes an excess of sugar were the important dietary factors in the causation of scurvy. A few years later we find him coming round to the newer theories, for in 1776 he communicated to the Royal Society a memorandum on "Late Improvements for Preserving the Health of Mariners," in which Captain Cook's observations on the antiscorbutic value of infusions of vegetables, sweetwort, and small beer were presented with obvious sympathy. The conversion came too late to save Stark.

We wish to acknowledge valuable assistance in the search for details of Stark's life from Mr. R. R. James, F.R.C.S.; Mr. R. Brough, registrar of the University of Glasgow; Dr. J. D. Comrie, lecturer in the history of medicine at the University of Edinburgh; and Mr. J. M. Churchfield, secretary of St. George's Hospital London.

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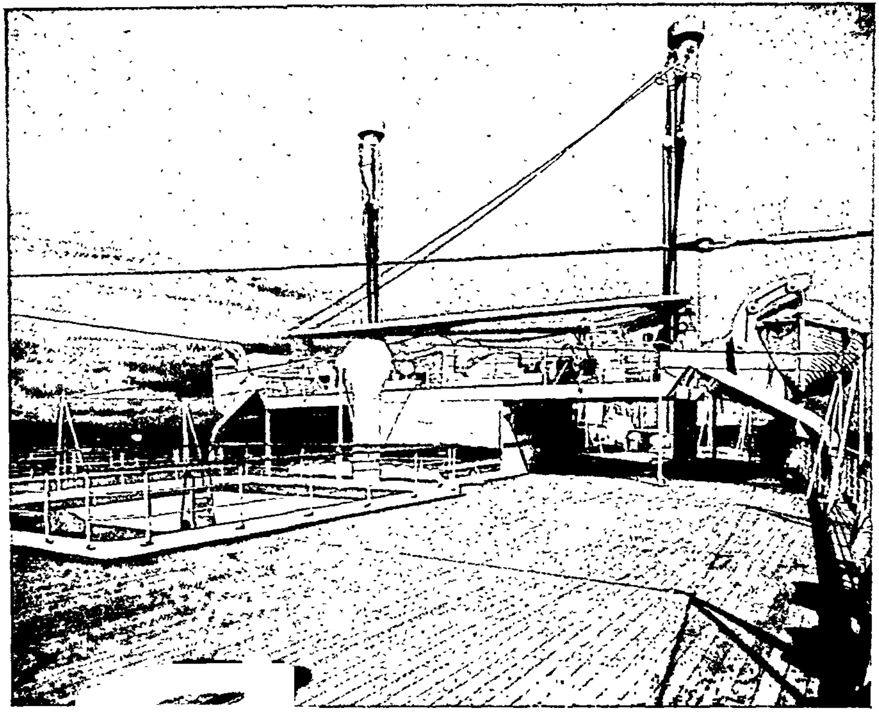
[2] We are hoping that the other part of Stark's work, his anatomical and clinical studies, will attract the attention of someone interested in the history of medicine and qualified to express an opinion of their value. Perhaps he will also offer a diagnosis of Stark's fatal illness.

"THE AMBLYOPIA READER," by Dr. Margaret Dobson, mentioned in a leading article last week, is to be published by Oxford University Press.

MATERNITY HOSPITAL FOR HARROW.—Subject to the approval of the Minister of Health, the Harrow and Wembley urban district councils are jointly to provide a maternity hospital with 70 beds at an estimated cost not exceeding £56,000.

A NEW LINER

THE Orient liner *Orion*, which was launched at Barrow last December by the Duke of Gloucester pressing a button at Brisbane, began her first voyage last week by taking a party of guests from Tilbury to Southampton. The vessel carries 486 first-class passengers and 653 tourist-class passengers on eight decks, including the promenades, and although the wealthy traveller can still command extra elbow room there is no essential amenity on the vessel which is not open to every traveller. The C deck has been extended right to the stern, giving the tourist section a fine expanse of open games deck with its own built-in open-air swimming-bath and dressing-rooms; the tourist deck below this contains the widest expanse of promenade on the whole ship, and a children's nursery complete with hostess and stewardess, with its own lavatory, and arranged so that even in port when cargo is being worked the children may play in the open air without straying into trouble. This levelling up of accommodation which extends also to the crew's quarters is the most striking feature of the new liner. On the first-class side there are no inside cabins and all the cabins on C deck have sash windows and many on D deck have sash windows replacing the old port-hole. This is a tremendous asset for the large proportion of the voyage which is spent in tropical seas, but when windows must be closed the air-conditioning plant provides cool and if necessary dry air to every part of the boat. It is claimed that the conditioning plant is the first complete installation of its kind on a British ship and that by its means comfortable internal conditions can be maintained with the outside temperature varying from 100° to 15° F., and the relative humidity from 100 to 40 per cent. Thus the vessel contains all the elements of comfort and hygiene for a long voyage that can be desired by every kind of traveller, but there is nothing of ostentation and little suggestion of luxury, mainly because the effect does not depend on isolated pieces of decoration but on a uniform scheme pervading the whole; for an architect, Mr. Brian O'Rorke, was made responsible for the interior decoration throughout and was given control over the designers of special items and the firms carrying out the decorative construction. There can be no boat on the water in which the design is so restful and harmonious within and without, or in which there is no dark corner to be found. Nor is there any apparent sacrifice to speed. When really steaming at 21 sea-miles an hour the vessel's single funnel and mast with scarcely any rake create an illusion of gentle indolence, confirmed by the entire absence of engine vibration. The medical arrangements are unobtrusive but sufficient. There are two experienced surgeons on board. The hospital is a self-contained deckhouse, divided into four sections so that infectious cases may be effectively isolated; a decorative pestle and mortar indicates the way to the dispensary and doctor's surgery. But apart from pestilence or accident illness is likely to be infrequent on a vessel designed for healthy living, and the abundant store of pills will not rapidly diminish where sport and exercise are available for everyone.



Photograph by Stewart Bale.

Tourist deck of the *Orion*, showing the open-air swimming-bath, the unobstructed view beneath the life-boats, and the free space for recreation and sport.

ETHICAL PHARMACEUTICALS ASSOCIATION (E.P.A.)

A NUMBER of firms representing manufacturers of ethical pharmaceutical preparations—i.e., preparations not advertised to the public—have formed themselves into an association to represent this particular branch of the pharmaceutical trade. The chief objects of the Association are to represent and conserve the interests of the members, to afford a means of exchange of views in matters of mutual concern, and, in general, to act on behalf of members on all trade matters. The secretary of the Association, Mr. J. E. Woodhead, B.Sc., F.I.C., may be addressed at Coronation House, 4, Lloyd's-avenue, London, E.C.3.

FUMIGATION WITH HYDROGEN CYANIDE

A FEW weeks ago a fatal accident during the fumigation of vermin-infested cottages directed public attention to the exceedingly poisonous character of hydrocyanic acid gas, but, as we pointed out[1] at the time, "so valuable is this method of destroying rats and vermin that, in spite of its dangers, prohibition of its use is inadvisable." It is however a misfortune that the Ministry of Health has no statutory power to make regulations for the control of fugimation. We have now received from the London Fumigation Co., Ltd. (Marlow House, Lloyd's-avenue, E.C.3), a little brochure assembling facts about hydrocyanic acid which may be of practical assistance to sanitary inspectors. The primary object of the booklet is the excellent one of fortifying the inspector with sufficient knowledge to enable him to gauge the competency of a fumigation service or to undertake the work himself. The particular preparation of hydrocyanic acid for which this firm is responsible is known as Zylon, and contains a lacrymator with a pronounced smell, for it is found in practice that a number of people do not recognise the smell of hydrocyanic acid until a dangerous concentration is reached. This added lacrymator being heavier than HCN lingers in the atmosphere longer than the HCN itself. The pamphlet contains directions what to do when HCN has been inhaled, for it is seldom, the pamphlet says, that the practical fumigator does not experience at some time or other a single inhalation of a fairly strong concentration or a prolonged exposure to lighter concentrations.

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[1] THE LANCET, 1935, i., 1065.

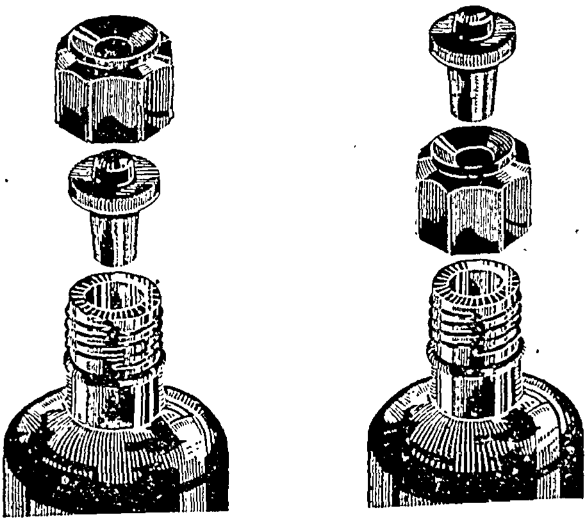
NEW PREPARATIONS

Luizym.—This preparation of digestive enzymes is manufactured at the Luitpold works in Munich and is put on the market by Medical Laboratories, 40, Pall Mall, London, S.W.1. It is stated to give relief in cases where there is an excessive formation of gas in the intestine after eating various vegetables and fruits and farinaceous foods and potatoes. The medical support given to the use of the preparation is set out in a communication from A. E. Lampé and A. Schmidt-Ott, Munich, in the *Münchener medizinische Wochenschrift*, where its use in cases of flatulent colic is stressed. The preparation, which has a savoury flavour, is made up in tablets, and the container, which is opaque as a precaution against the action of light, should be kept in a cool dry place.

Veganin Brand Tablets.—This preparation is put on the market by Messrs. William R. Warner and Co., Ltd., 300, Gray's Inn-road, W.C.1. It is made up in tablets, each of which contains codeine phosphate (poison) 0·01 g., phenacetin 0·25 g., acetylsalicylic acid 0·25 g., excipient 0·09 g. The combination of antipyretic, local analgesic, and sedative is claimed to be useful in the relief of pain, particularly in inflammatory conditions of the ear, nose, and throat, and in neuralgia and dysmenorrhœa.

THE COLLOSEAL: NEW CAPPING DEVICE

We have received a bottle from The Crookes Laboratories, Park Royal, London, N.W.10, containing a specimen of their well-known Collosol Manganese, but the interest attached in this case to the sample lies in its stopper, the "Colloseal." The accompanying picture illustrates an ingenious device incorporating the advantages alike of a stopper and cap, which, we are informed by the firm, will now be fitted to all Collosol aqueous solutions.



Appointments

Blauvelt, H. O., F.R.C.S. Eng., has been appointed surgeon (Grade 2) at the North Middlesex County Hospital.

Davies, D. T., M.D., F.R.C.P. Lond., assistant physician to the Hospital of St. John and St. Elizabeth, London.

Davies, Woodfield, L.M.S.S.A., anæsthetist to the British Postgraduate Medical School.

Erwin, G. S., M.B. N.Z., resident medical officer at the Hospital for Consumption, Brompton.

Gregory, Philip, M.B. Manch., hon. surgeon in charge of the Eye Department of the Infirmary, Stockport.

Housden, G. M., M.B. Lond., assistant anæsthetist at the Miller General Hospital, Greenwich.

Howat, H. T., M.B. St. And., resident clinical pathologist at the Manchester Royal Infirmary.

Kilner, T. Pomfret, M.B. Lond., F.R.C.S. Eng., consulting surgeon to the Hospital for Tropical Diseases, London.

MacLachlan, I. M., M.D. Durh., B.Hy., D.P.H., tuberculosis officer and senior assistant medical officer of health for Portsmouth.

Moore, A. M. A., F.R.C.S. Eng., assistant surgeon at the King George Hospital, Ilford.

Morgan, C. Naunton, M.B. Lond., F.R.C.S. Eng., surgeon to the Hospital for Tropical Diseases, London.

O'Sullivan, J. V., M.D. N.U.I., F.R.C.S. Eng., M.R.C.P. Lond., M.C.O.G., assistant visiting obstetrician at the Kingston and District Hospital.

Rait-Smith, B., M.R.C.S. Eng., anæsthetist to the British Postgraduate Medical School.

Seekings, T. A., M.D. Lond., D.P.H., medical officer of health and port medical officer for Barrow-in-Furness.

Simpson, S. Levy, M.D., M.R.C.P. Lond., hon. assistant physician to the Princess Louise Kensington Hospital for Children.

Walker, F. H. Aitken, B.Chir. Camb., F.R.C.S. Eng., surgical registrar at the Royal Berkshire Hospital, Reading.

Williams, Marion, M.R.C.S. Eng., anæsthetist at the Miller General Hospital, Greenwich.

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O.(I.) =Assistant medical officer, Grade I. D.M.Sup. (II.) = Deputy medical superintendent, Grade II.

Henderson, R. G., M.D., D.P.H., D.M.Sup.(II.), Park Hospital;
Hunter, A., M.D., D.P.H., D.M.Sup. (II.), Grove Hospital
Thompson, A. R., M.D., D.P.H., A.M.O.(I.), South-Eastern Hospital.

Certifying Surgeons under the Factory and Workshop Acts: Dr. G. H. **Dymond** (Hammersmith, Middlesex); Dr. M. **MacCulloch** (Alloa, Clackmannan); Dr. J. R. E. **James** (Carmarthen District, Carmarthen); Dr. G. B. **Sleigh** (Alyth, Perth).

Births, Marriages, and Deaths

BIRTHS

Bowesman.—On August 15th, at Billericay, the wife of Reginald Bowesman, M.B. Dub., of a son.

Crowe.—On August 12th, the wife of W. Nigel Crowe, M.D. Durh., Headingley, Leeds, of a son.

Farr.—On August 10th, at Hong-Kong, the wife of F. J. Farr, M.B. Brist., of a son.

Gourlay.—On August 17th, at Bentinck-street, to Janet Vaughan, D.M. Oxf., wife of David Gourlay, Gordon-square, W.C.—a daughter.

Green.—On August 14th, at Banff, the wife of Herbert J. Green, M.B. Aberd., of a son.

Smyth.—On August 11th, at Harley-street, W., the wife of Michael Smyth, F.R.C.S. Eng., of a daughter.

Stewart.—On August 10th, at Welbeck-street, W., the wife of Harold Stewart, B.Chir. Camb., of Barnet, of a son.

MARRIAGES

Alston—Sandes.—On August 16th, James Maxwell Alston, M.B., M.R.C.P. Edin., to Gladys Maud Sandes, B.S., F.R.C.S. Eng.

Bridge—Hann.—On July 27th, at Hampstead, John C. Bridge, C.B.E., F.R.C.S. Edin., to Joan Phyllis Hann, daughter of Mr. James S. Hann, of Finchley.

Reckitt—Taylor.—On August 10th, at Christ Church, Lancaster Gate, Vincent Booth Reckitt, M.B., B.S. Lond., to Mary (Mollie), second daughter of Mr. Harrison Taylor, of South Croydon.

DEATHS

Anderson.—On August 17th, at Dundee, John Anderson, D.S.O., M.B. Aberd., F.R.C.S. Edin., professor of surgery at St. Andrew's University, aged 49.

Wyncoll.—On August 11, at Eastbourne, John William Wyncoll, M.B. Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Mental Welfare Centre.—A mental welfare centre, the first to be inaugurated in Yorkshire, has been opened in Leeds and will serve the Wakefield Mental Hospital area.

STUDENTS' GUIDE—SESSION 1935-1936

THE GENERAL MEDICAL COUNCIL

POWERS, DUTIES, AND CONSTITUTION

THE General Council of Medical Education and Registration of the United Kingdom is, first, a registering body: no person, even though his qualifications have been obtained by examination, is a *legally qualified* medical practitioner until his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that there is a definite minimum of medical education and scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner convicted of felony or misdemeanour or adjudged guilty of professional misconduct. Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council consists of 39 members, of whom 18 are appointed by universities and 9 by licensing corporations; 5 members are chosen by the Crown on the advice of the Privy Council, and 7 others are elected by the members of the medical profession as Direct Representatives. The Crown members and the university representatives need not be medical men, and one layman appointed by the Privy Council now sits on the Council. Three members are appointed for dental business by the Privy Council under the Dentists Act, 1921, under which the powers and duties of the General Medical Council with regard to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the Dental Board of the United Kingdom.

The Educational Curriculum

Professional Education.—The course of professional study after registration as a student occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

REGISTRATION OF MEDICAL STUDENTS

Before registration as a student every candidate must produce evidence that (*a*) he has attained the age of 17 years; (*b*) that he has passed a recognised examination in general education; and (*c*) that, *in addition thereto*, he has passed, or obtained exemption from, an examination, theoretical and practical, in elementary physics and elementary chemistry conducted or recognised by a licensing body. The standard of General Education required is approximately that of University Matriculation or entrance examination in the Faculties of Arts or Pure Science. Examinations, other than Matriculation, must be of the standard prescribed in Section 2 of the Regulations below.

An approved course of instruction in elementary biology at a secondary school or other teaching institution recognised by a licensing body may admit a student to the professional examination in elementary biology upon registration as a medical student. The student should in every case write beforehand to the Body whose qualification he desires to obtain, and, although it is not necessary to pass in Biology before registration as a student, application should be made at the same time to the Body selected to ascertain their requirements.

The candidate commencing medical study should apply to the registrar of the division of Great Britain and Ireland in which he is residing, according to a prescribed form copies of which may be had on application to the several licensing bodies, medical schools, and hospitals, or at the offices of the Council; and should produce proof that he, or she, has fulfilled the first three conditions.

MAINTENANCE OF REGISTER OF MEDICAL STUDENTS

1. The Education Committee prepares and issues from time to time a list of examining bodies whose examinations in general education fulfil the conditions of, and are recognised by, the Council.

2. The Council has recognised the undernoted university examinations which are conducted in Great Britain and admit to the Faculties of Arts or Pure Science, or to other Faculties, subject to the conditions specified below:—

Oxford University, Responsions; Cambridge University, The Previous Examination. The Matriculation Examinations of the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Victoria of Manchester, Sheffield and Wales, and the Entrance or Preliminary Examination of the Universities of Scotland.

The condition prescribed by the Council in Faculties other than Arts or Pure Science is that:—

The certificate shall bear evidence that the candidate has passed at the Matriculation or Entrance standard in the following subjects, viz.: (*a*) English. (*b*) Mathematics, Elementary. (*c*) A language other than English. (*d*) A fourth subject, as defined in the regulations of the particular Examination, to be chosen from the subjoined list, viz.: History, Geography, Physical Science, Natural Science, Botany: Latin, Greek, Hebrew, French, German, or other language accepted by the University.

3. Subject to the condition prescribed above (Section 2), the Council will recognise those of the examinations conducted by recognised authorities in Great Britain which are accepted by any *one* or more of the above-named Universities as equivalent (under prescribed conditions as to "credits" or "grades"), for purposes of Entrance or Matriculation, to an Examination named in the preceding list (Section 2). In School or Leaving Certificates, the four required subjects must have been obtained at not more than *two* sittings. Such Examinations are:—

Bristol University: Higher School Certificate Examination; School Certificate Examination. Cambridge Local Examinations Syndicate: Higher School Certificate Examination; School Certificate Examination. Central Welsh Examination Board: Higher Certificate Examination; School Certificate Examination. Durham University: Higher Certificate Examination; School Certificate Examination. London University: Higher School Certificate Examination; General School Examination. Northern Universities Joint Matriculation Board: Higher Certificate Examination; School Certificate Examination. Oxford and Cambridge Schools Examination Board: Higher Certificate Examination; School Certificate Examination. Oxford Delegacy for Local Examinations: Higher School Certificate Examination; School Certificate Examination. Scottish Education Department: Leaving Certificate Examination.

4. The Council will continue to recognise certain Examinations conducted by Educational Bodies, other than those (mentioned in Section 3) whose Examinations are accepted by any one or more of the Universities of Great Britain. Recognition will not be extended under this Section to any Examination unless the Council is satisfied (*a*) that in scope and standard it is equivalent to a recognised Matriculation or Entrance Examination of a University of Great Britain, (*b*) that it fulfils the condition prescribed by the Council (Section 2), and (*c*) that the Examination has been completed at not more than two sittings. Such Examinations are:—

The College of Preceptors (England): Senior Certificate (with *credit*). The Educational Institute of Scotland: Preliminary Medical Certificate.

5. Subject to the prescribed condition (Section 2), the Council will recognise the Entrance Examination to the School of Physic of the University of Dublin, and the Matriculation or Entrance Examinations of the National University of Ireland, the Queen's University of Belfast, the Irish Royal Colleges of Physicians and Surgeons; and also the Senior Grade or Leaving

Certificate of the Department of Education of the Irish Free State, the Senior Certificate Examination of the Ministry of Education of Northern Ireland, and all examinations accepted by any one or more of the Universities of Great Britain or Ireland, as equivalent, for purposes of entrance or matriculation, to the above-named University Examinations.

6. Subject to the prescribed condition (Section 2), the Council will recognise all Examinations of Colonial or Foreign Universities which are accepted by any one or more of the Universities of Great Britain as equivalent for purposes of entrance or matriculation, to an examination named in the list of examinations recognised by the Council (Section 2).

7. The Council will recognise the Final Examinations for Degrees in Arts or Science of any University of Great Britain or Ireland or of the British Dominions.

8. The registration of medical students is placed under the charge of the Branch Registrars.

9. Each of the Branch Registrars keeps a register of medical students.

10. The Branch Registrar enters the student's name and particulars in the Student's Register, and gives him a certificate of such registration.

11. Each of the Branch Registrars supplies to the several licensing bodies, medical schools, and hospitals, in that part of Great Britain or Ireland of which he is Registrar, blank forms of application for the registration of medical students.

12. A copy of the Medical Students Register prepared by each of the Branch Registrars is transmitted, on or before Dec. 31st in each year, to the Registrar of the General Council, who distributes the list to the licensing bodies, medical schools, and hospitals.

All applications for special exceptions to the foregoing regulations as to registration should be addressed to the Registrar of the General Council, and are decided by authority of the Education Committee, who report thereon to the Council.

MEDICAL SCHOOLS AND COLLEGES

The Universities, including their Colleges and Medical Schools, and Schools of Medicine at which Medical Study may be commenced in the United Kingdom are set out seriatim in the following pages.

Medical Registration in Ireland

By legislative agreement between the Governments of Great Britain, of the Irish Free State, and of Northern Ireland—the powers and duties of the General Council of Medical Registration and Education are continued as heretofore in respect of qualifying bodies in the Irish Free State, and of medical practitioners qualified in the Irish Free State. Side by side with this a Medical Council has been set up in the Irish Free State with the duty of establishing and controlling a Register for the Irish Free State. Practitioners whose names are on the General Register, and persons who pass a qualifying examination in the Irish Free State, will be registered on the Irish Free State Register on payment of the prescribed fee. The Irish Free State Medical Council have, over those whose names are on the Irish Free State Register, the same disciplinary powers as are possessed by the General Council over those whose names are on the General Register. To possess the privileges of a qualified practitioner in the Irish Free State it is necessary to be registered in the Irish Free State Register.

The net result of the change in the law as regards the practitioner qualifying in the Irish Free State in the future is that: (1) if he intends to practise only in the Irish Free State he need only register in the Irish Free State Register; (2) if he intends to practise in Great Britain he will register in the General Register; and (3) if he is in doubt where he will practise he will register in both Registers. He will, as he registers in one Register, or in both Registers, put himself under the disciplinary control of the one Council or of both Councils. No practical inconvenience is caused, and practitioners qualified in the Irish Free State in future will not find themselves deprived of any former privileges or rights.

Dental Board of the United Kingdom

Anyone who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without a degree or licence in dentistry; but it is a distinct advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available, and, unless the practitioner is on the Dentists Register, no work can be undertaken under the National Health Insurance (Dental Benefit) Regulations.

Under the Dentists Act, 1921, the powers and duties of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the then newly constituted Dental Board of the United Kingdom. The registration of dental students at the commencement of their dental studies, and the power to erase a name from the Dentists Register, remain with the Council, but the inquiry into disciplinary cases rests with the Board, who forward their reports and findings to the Council.

The Dental Board consists of a chairman and 12 members. The chairman is appointed by the Privy Council. Other members of the Board are appointed by the Minister of Health, the Department of Health for Scotland, the Governor of Northern Ireland, the General Medical Council (3), four members are elected as representatives by the dentists possessing degrees or licences in dental surgery or dentistry, and practising in England and Wales, Scotland, and Ireland, and two by dentists registered under the Dentists Act, 1921.

REGISTRATION OF DENTAL STUDENTS

The General Medical Council's Regulations in regard to the registration of dental students have recently been revised. The new regulations came into force on Oct. 2nd, 1933, and provide that the registration of dental students shall be carried on at the General Medical Council Office in London, in the same manner as that of medical students, and be subject to the same regulations as regards age and preliminary examinations; but professional study may commence either at a recognised dental hospital or school, or by pupilage with a registered dental practitioner.

Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in dental mechanics. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school. Two years' bona-fide apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study. When a student can show evidence of regular pupilage for not less than two years in dental mechanics to a registered dentist, prior to the passing of the prescribed preliminary and scientific examinations, he may antedate his registration for a period not exceeding one year prior to the passing of these examinations.

Offices

The address of the Registrar, to whom further communications should be addressed, is as follows: The Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W.1. The offices of the Dental Board are at the same address.

A memorandum on the procedure to be adopted by those who desire to enter the profession of medicine, with notes on costs and prospects, and a similar memorandum in regard to dentistry, may be obtained on payment of 1s. each.

MEDICAL EXAMINING BODIES AND SCHOOLS IN ENGLAND AND WALES *

UNIVERSITY OF OXFORD

THERE are two degrees in Medicine, *B.M.* and *D.M.*, two in Surgery, *B.Ch.* and *M.Ch.*, and a diploma in *Ophthalmology*. The examinations are open to men and women alike.

Only Graduates in Arts of the University are eligible for the Medical and Surgical degrees. The most convenient course for the B.A. degree for intending graduates in Medicine is to take Responsions, the Preliminary Science Examinations mentioned below, and the Final Honour School of Animal Physiology.

To obtain the degrees of B.M. and B.Ch. the following examinations must be passed: 1. Preliminary subjects: Physics and Chemistry, Zoology, and Botany. 2. Professional. (*a*) First Examination: Subjects—Organic Chemistry, unless the candidate has satisfied the examiners in Part I. Chemistry in the Honour School of Natural Science; Human Physiology, unless he has obtained a First or Second Class in Animal Physiology in the Honour School of Natural Science; Human Anatomy. (*b*) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine and Public Health, Materia Medica and Pharmacology. The First and Second Professional examinations are held in June and December. The First B.M. Examination may be passed at any time after the Preliminary Scientific examinations. Anatomy and Physiology must be passed at the same time—Organic Chemistry may be taken separately.

At any time after passing *First B.M. Examination*, the candidate can, on producing certain certificates, present himself for examination in the subjects of Pathology, Forensic Medicine and Public Health, Materia Medica and Pharmacology; but cannot, unless he is already a registered medical practitioner, enter for Examination in Medicine, Surgery, and Midwifery, until the eighteenth term from his matriculation, nor until a period of at least thirty-three months has elapsed from the date of passing the First B.M. Examination. He must pass in Medicine, Surgery, and Midwifery at one and the same time.

Before admission to the Examinations in Pathology and Bacteriology, and Materia Medica and Pharmacology, of the *Second B.M. Examination*, the student must produce certificates of having attended courses of instruction including practical work in Pathology, Bacteriology, Post-mortem Clerking, and Pharmacology, either in Oxford or in another recognised Medical School. Before admission to the remainder of the Second B.M. Examination, he must produce a number of other certificates, including evidence of having acted as Clinical Clerk and Dresser, each for six months in the Wards, of instruction in Midwifery and of attendance on Labours, of instruction in Infectious Diseases and in Ophthalmology, of proficiency in Vaccination and in the administration of Anæsthetics, and of three academic years of hospital practice.

The degree of Bachelor of Surgery (B.Ch.) is granted with that of B.M. after passing the above examinations.

The degree of Doctor of Medicine (D.M.) is granted to Bachelors of Medicine of the University who have entered upon their thirtieth term from Matriculation, and have submitted a dissertation which is approved by judges appointed for the purpose by the Board of the Faculty of Medicine. The degree of Master of Surgery (M.Ch.) is granted after examination to Bachelors of Surgery who have entered upon their twenty-first term, and who are members of the surgical staff of a recognised hospital, or have acted as dresser or house surgeon in such a hospital for a period of six months. The examination, which includes Surgery, Surgical Anatomy and Pathology, and Surgical Operations, is held annually in June, after the Second B.M. Examination.

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for two years and of the annual value of £300. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Department of Medicine, University Museum. A Schorstein Research Fellowship of the value of £200 a year, tenable for two years, is offered in alternate years. Candidates must be graduates of the University, under 35 years of age, and must hold a registrable medical qualification. Their research must be carried out in one of the Medical Departments at Oxford. A Christopher Welch Scholarship of usually £200, tenable for four years, is awarded annually after examination. Candidates must be men undergraduate members of the University, who have not exceeded the twelfth term from their matriculation, or been admitted to any degree in the University. They may offer any one of the subjects, Animal Physiology, Botany, Zoology. A George Herbert Hunt Travelling Scholarship of the value of about £100 is awarded every second year to enable a Bachelor of Medicine to undertake three months' study abroad. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially (alternating with the Rolleston Memorial Prize) for research in some branch of medical science. The Theodore Williams Scholarships are awarded annually in the subjects of Anatomy, Physiology, and Pathology; the two first are of the value of £50 a year for two years, the last of the value of £60 a year for two years. A Radcliffe Scholarship in Pharmacology, of the value of £50 for one year, is awarded annually by the Master and Fellows of University College. Scholarships at certain London hospital medical schools are awarded each year on the nomination of the Regius Professor of Medicine. The Scholarships and Exhibitions in Science which are offered by most Colleges are open to those who intend to pursue Medicine. The value of these scholarships varies, according to the candidate's need, between £30 and £100 a year; the exhibitions vary in value from £30 to £80 per annum. The number of scholarships and exhibitions in Science offered annually is about forty. There are also Medical Scholarships of the value of £100 a year at University College and at Pembroke College. The Welsh Memorial Prize for Anatomical drawing is awarded annually, and is of the value of about £4.

More detailed information may be obtained from the University Calendar; from the Examination Statutes, latest edition; from the Regius Professor of Medicine; from the Professors in the departments of medical science; and from the Dean of the Medical School, Department of Medicine, University Museum, Oxford.

The Radcliffe Infirmary

There are 389 beds. Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) clinical lectures by the Litchfield Lecturers in Medicine and Surgery; (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation; and (4) pathological demonstrations and instruction in post-mortem work are given by the Pathologist. Opportunities are offered to students who wish to act as surgical dressers and clerks. A post-graduate course is held in the hospital in the autumn of each year.

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* For special diplomas see p. 529.

UNIVERSITY OF CAMBRIDGE

There are two degrees in Medicine, *M.B.* and *M.D.*, wo in Surgery, *B.Chir.* and *M.Chir.*, and a Diploma n *Medical Radiology and Electrology.* Students of Girton or Newnham College are admitted to the examinations for these degrees and the diploma.

The student must enter a College, or become a Non-Collegiate student, and keep nine terms (three years) by residence. He must pass the Previous Examination of the University before he comes into residence or therefrom obtain exemption, particulars of which may be obtained from the Registrary. He may then devote himself to medical study in the University. Under new regulations it is necessary for a candidate to take an Honours degree in Arts by passing one or more Tripos Examinations. The Natural Sciences Tripos is taken most frequently by medical students, for if the required standard is reached in Anatomy and Physiology in this Tripos no further examination is required in those subjects. The student must in addition take one more subject or two half-subjects. Pathology and Biochemistry, which are of great practical importance to medical students, can both be taken as half-subjects. If a student fails to reach an honours standard, he is required to take the examination in a subsequent year before he can proceed to the Final M.B. Examination.

For the degree of Bachelor of Medicine (M.B.) five calendar years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three years are spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the *First Examination* and other preliminaries to the *Final Examination.* Hospital practice may be attended at Addenbrooke's Hospital, Cambridge. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, and Psychology are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

The *First M.B. Examination* includes (1) General and Inorganic Chemistry, (2) Physics, (3) Elementary Biology, and (4) Inorganic Chemistry. These parts may be taken together or separately. After the First Examination, and tests in Pharmacology, Physiology, and Anatomy, comes the *Final Examination*, divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept by the candidate reading an original dissertation composed by himself, and being examined orally, on some subject approved by the Regius Professor of Physic. Candidates who have passed both parts of the Final M.B. Examination are admitted to the registrable degree of Bachelor of Surgery (B.Chir.) without separate examination and without keeping an Act.

The degree of Doctor of Medicine (M.D.) may be taken by a graduate of the University of eight years' standing who has passed the Final M.B. Examination. An Act has to be kept, consisting of an original Thesis with viva-voce examination; and an examination, oral or written or both, on the field of Medicine within which the Thesis falls may be allowed or required.

Candidates for the Degree of Master of Surgery (M.Chir.) who are M.A.'s may be admitted to the examination after they have become legally qualified under the *Medical Acts* to practise surgery. Others may be admitted to the examination when two years at least have elapsed after they have completed all that is required of candidates for the Degree of B.Chir. Candidates are required to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject. (The examination is held in February.)

A Diploma in Medical Radiology and Electrology is granted. Candidates must hold a recognised medical qualification.

Scholarships and Prizes.—Medical studies are endowed by the numerous Natural Science scholarships at the various colleges, information about which can be obtained from the respective Tutors. There are Natural Science scholarships at most of the Colleges and prizes in the ancillary medical subjects. Some of these are entrance scholarships; some may be gained by students already in residence, and where suitable candidates are not forthcoming among such students the emoluments may be allotted to members of other Colleges. Valuable scholarships instituted on behalf of Medicine are the Tancred Studentships in Physic, tenable at Gonville and Caius College. The successful candidates must enter at the college within a month or remove there if they are members of any other college. Students are required to take the degree of M.B. as soon as they are of sufficient standing but may hold a Studentship for a further three years. Thus a student elected previous to admission to college can draw the emolument, the annual value of which is about £100, for eight years. Full particulars can be obtained from Mr. E. T. Gurdon, 28, Lincoln's Inn-fields, London. Among other scholarships and prizes may be mentioned the Balfour Studentship, for research in Biology, of the value of £300 a year for three years, not restricted to members of the University; the Frank Smart Studentship and Prizes for Botany and Zoology; the Shuttleworth Studentship for Zoology or Physiology tenable at Gonville and Caius College; and the Marmaduke Shield Scholarship in Human Anatomy. The one University prize in Medicine, the Raymond Horton Smith Prize, is awarded to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a Tripos Examination. The E. G. Fearnsides Research Scholarship and several very valuable studentships are also awarded.

An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Physics, Biology, Pharmacology, and General Pathology may be obtained upon application to the Registrary, The Registry, Cambridge.

Addenbrooke's Hospital

312 beds. Clinical lectures in medicine and surgery, in connexion with Cambridge University medical school, are given at this hospital during the academical year; and practical instruction in medicine and surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations.

UNIVERSITY OF LONDON

The University of London was constituted in 1836, reconstituted under Act of Parliament, 1898, as a teaching as well as an examining body, and again reconstituted under Act of Parliament, 1926. All the metropolitan medical schools are constituent colleges, while Clinical Units have been established at St. Bartholomew's, the London, St. Mary's, St. Thomas's, University College Hospital, and the Royal Free.

A revision of the medical curriculum is under consideration, in view of a report submitted to the Senate by a Conference of representatives nominated by the Universities of Oxford, Cambridge, and London, the English Royal Colleges, and the Society of Apothecaries.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who are registered as pursuing a prescribed course of study, or an approved course of research, in a school of the University, or under teachers of the University. Centres for preliminary and intermediate medical studies have been established by the University at University and King's Colleges. External students in addition to matriculating must register as preparing for an examination leading to a Degree or Diploma within the purview of the Council for external students.

UNIVERSITY COLLEGE

University College is a University centre for the teaching of medical sciences. The College Faculty of Medical Sciences comprises the departments of physics, chemistry, botany and zoology (the Preliminary Medical Sciences); also the departments of anatomy and embryology, physiology, biochemistry, and pharmacology (the Intermediate Medical Sciences). Post-graduate and research work is undertaken in all departments. The completion of the building scheme by the erection of the section for anatomy, histology, and embryology, together with further extensions to the department of physiology, biochemistry, biophysics, and pharmacology, and the provision of new accommodation for the department of zoology, which the generosity of the Rockefeller Foundation made possible, provides exceptional facilities for research and post-graduate study. The opportunities for investigation in human and comparative embryology and neurology, in histology, radiology, anthropology, biochemistry, and experimental physiology and embryology may be mentioned. In the department of zoology and comparative anatomy, the study of genetics accompanies that of comparative physiology and animal behaviour. Arrangements exist for the close correlation of the work of the Faculty with University College Hospital and Medical School. Women students are admitted.

Scholarships and Prizes.—The first four items on the present list provide a complete intermediate course at University College, and, in the case of (*a*), the later clinical stages at University College Hospital. The money value and subjects at examinations are as follows: (*a*) Bucknill Scholarship, 160 guineas; (*b*) and (*c*) two Entrance Exhibitions, 55 guineas each, Chemistry, Physics, Botany, Zoology, and an English essay; (*d*) Entrance Scholarship, £30 a year for three years; (*e*) Ferriere Scholarship, £25 for three years, tenable at University College Hospital Medical School, awarded to a student who has done his Anatomy and Physiology at University College and has completed the 2nd Medical Examination; (*f*) Cluff Memorial Prize, £15 biennially, Anatomy, Physiology, Pharmacology, and Chemistry; (*g*) Schafer Prize in Physiology, £18 triennially; (*h*) Sharpey Physiological Scholarship, about £112, Biological Sciences; (*i*) Bayliss-Starling Scholarship, £120 a year, Physiology, Biochemistry; (*j*) Percy F. Macgregor Research Scholarship in Embryology, £50; (*k*) Morris Bursary for sons of deceased professional men, by nomination, tenable for two years, £20 a year; and (*l*) two Gold Medals awarded annually in Anatomy and Physiology. For information apply to the Secretary, University College, Gower-street, London, W.C.1.

KING'S COLLEGE

The Medical Faculty at this College of the University gives instruction in the subjects of Medical Science for all the usual Preliminary and Intermediate Examinations in Medicine and Surgery. Through the four associated hospitals, students of the College have clinical facility of over 1000 beds, but they may also proceed to any other teaching hospital in London for final studies for the degrees of the University.

The Medical Faculty of the College provides a general University education in touch with other Faculties, classes of which medical students are permitted to attend. There are many College societies, clubs, and functions, in which students of all faculties have opportunity of meeting each other. The College has a large athletic ground at Mitcham, upon which is a new pavilion.

The First Year subjects are taught in the large Departments of the Faculty of Science and those for the Second and Third Years in the new Medical Department, consisting of the Hambleden Department of Anatomy and an extension to the department of physiology, built at a cost of £70,000. These new buildings and others of recent years provide the College with a completely new and modern Medical Department which embodies the newest ideas in laboratory construction and equipment.

Scholarships and Prizes.—Two Warneford Entrance Scholarships of £30 each for four years. Examination in May, subjects selected from Divinity, Classics, Science. One Sambrooke Scholarship of £30 for three years. Examination in May, subjects selected from Classics, Science. Worsley Scholarships: £100 in five annual instalments of £20. *At the end of the First Year* of study, one Warneford Scholarship of £30 for four years, subjects as for First M.B.; the Rabbeth Scholarships (£30 and £15), the Carter Gold Medal and Prize in Botany, and the Hare Prize in Zoology are open for competition. *At the end of the Third Year*, the Hughes Prize in Anatomy, the Huxley Prize in Physiology, the Inchley Prize in Pharmacology, and the Jelf Medal are open for competition. The Layton and the Berridge Research Studentships (£150 and £100 per annum respectively), the Daniell Scholarship in Chemistry (£40), Warneford Prizes (£25 and £15), Leathes Prize, Barry Prize, &c., are also open to Students of this Faculty. The majority of the Scholarships and Prizes are open to Regular Students only. For information apply to the Dean of the Medical Faculty.

The Medical Faculty of the University

Medical students of the University of London who are pursuing their medical curriculum in the metropolis will proceed to one of the recognised medical schools connected with the University. The schools are described in detail in the next section: they are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. Students of St. George's, Charing Cross, and Westminster Hospitals take their preliminary medical studies at King's College. Students of the London Hospital usually attend East London College for the subjects of their first medical examination. Various schools and hospitals are also recognised as schools of the University in special departments, and students may pursue their studies at other approved universities and medical schools.

The Faculty of Medicine of the University grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), the higher separate degrees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D.S. (*Bachelor of Dental Surgery*) and the degree of B.Pharm. (*Bachelor of Pharmacy*); the two higher degrees being open only to candidates holding the M.B., B.S. degrees of the University. The curriculum for the M.B., B.S. degrees is five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University.

A. *Internal Students.*—For the Bachelor's degrees in Medicine and Surgery a student must normally, after registration as an internal student, have: (1) Attended prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (*a*) the First Examination for Medical Degrees in Inorganic Chemistry, Physics, including Mechanics, and General Biology; (*b*) the Second Examination for Medical Degrees: Part I., Organic Chemistry; Part II., Anatomy, Physiology, and

Pharmacology; (*c*) the Third Examination for Medical Degrees, or M.B., B.S. Examination in Medicine, Surgery, Obstetrics and Gynæcology, Pathology, Forensic Medicine, and Hygiene.

B. *External Students.*—For the Bachelor's degrees in Medicine and Surgery an external student must (1) have passed the Matriculation examination or have been exempted therefrom not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to Matriculation and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools in the United Kingdom.

The First Examination for Medical Degrees (Inorganic Chemistry, Physics, including Mechanics, and General Biology) will take place twice in each year commencing on the Monday following Dec. 5th and on the first Monday in July. It must be passed not *less than nine months after matriculation.*

The Second Examination for Medical Degrees (Part I.): Organic Chemistry.—This examination will take place twice in each year, commencing on the Thursday following the second Monday in March and on the Thursday following the first Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate will be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the second Monday in November and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory courses in (1) Clinical Medicine; (2) Clinical Surgery; (3) Clinical Pathology; and the following: Experience as Clinical Clerk; course in Clinical Medicine; (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; Experience as a Surgical Dresser; course in Clinical Surgery; Ophthalmology; Oto-Rhino-Laryngology; (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery, (*f*) Mechano-therapeutics; Obstetrics and Gynæcology; Lying-in Hospital; the conduct of at least 20 Labours; Ante-natal Clinic; Experience as a Clinical Clerk in Gynæcological Work; General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; Work in the Post-mortem Room; Clinical Laboratory; Forensic Medicine; Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics, and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology, and may be taken either separately or together.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the second Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) Hygiene; and (6) Tropical Medicine. Any candidate may transmit to the Registrar a thesis for approval and may be exempted from a part or from the whole of the written examination, and in the case of Branch II. (Pathology) also from the practical examination.

Master of Surgery.—The examination for the degree of Mastery of Surgery takes place twice in each year: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology, and Rhinology. A thesis may be submitted as for M.D.

Doctor of Philosophy.—A Degree of Ph.D. has been instituted in non-clinical subjects for Internal and External Students in the Faculty of Medicine. Candidates for this degree must hold, in a branch of study akin to that in which they propose to proceed to the Ph.D. Degree, the Degree of M.B., B.S., or B.D.S., or B. Pharm., or B.Sc.

Bachelor of Pharmacy.—This is a three years' course.

Full details of the prescribed curricula can be obtained free on application to the *Academic Registrar*, or for External Degrees from the External Registrar, University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON

St. Bartholomew's Hospital and College

The hospital contains 762 beds, of which 692 are for patients in the hospital at Smithfield and 70 at the Alexandra Hospital, Swanley. Special departments have been organised for diseases of women and children, the eye, ear, larynx, and skin, as well as for orthopædic and dental surgery, and for electro-therapeutics and X ray work. Whole-time Clinical Units under professors of medicine and surgery have been established. A new surgical block of ten wards, with accommodation for 250 patients, and connected with a block of five new operation theatres is now in use.

Ten house physicians and ten house surgeons are appointed annually, are provided with rooms and board, and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear, and a house surgeon for orthopædic surgery are appointed every six months, and are provided with rooms and board and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum, with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students.

There are quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the College as well as a laboratory devoted to instruction in public health. A block is devoted to pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, and pathological chemistry. *The Medical College Buildings* include three large lecture theatres, a large dissecting-room, laboratories for chemistry, biology, morbid anatomy and histology, and public health, as well as a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is complete. A new block in Giltspur-street has recently been acquired and has been fitted up as lecture theatres and laboratories for physics, chemical physiology, experimental physiology, histology, and pharmacology.

The College has recently bought the site and buildings in Charterhouse-square (five minutes' walk from the Hospital), formerly occupied by The Merchant Taylors' School, and the whole of the preclinical departments will shortly be transferred there.

Special Classes for the Primary and Final F.R.C.S. Examinations are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. Facilities for research work are afforded in the Clinical Units and laboratories of pathological and other departments. *Vacation Anatomy Courses* are given in winter, spring, and summer.

Scholarships given in aid of Medical Study.—Six Entrance Scholarships and Exhibitions are awarded annually—viz.: (1) and (2) a Scholarship entitling the holder to free undergraduate medical education for a period of three years; and an Exhibition of £60 in any two of the following subjects: Human Anatomy and Embryology, Physiology, Pathology (including Bacteriology), Biochemistry; (3) a Scholarship of £100 in Chemistry, Physics, and Biology; (4) and (5) a Scholarship of £100 and the Jeaffreson Exhibition of £50 in Mathematics, Latin or Greek or French or German, a second language or Chemistry or Physics; (6) Helen Cave Memorial Scholarship, awarded after open competition to sons of Registered Medical Practitioners, value about £200, conditions obtainable from the Dean; (7) Shuter Scholarship of £50 in Anatomy and Physiology, which is awarded after competitive examination among Cambridge Graduates. The more important of the other Scholarships and prizes are as follows: Four Junior Scholarships—(8) No. 1, £30, Anatomy and Physiology; (9) No. 2, £20, Anatomy and Physiology; (10) No. 3, £25, Chemistry, Physics, and Biology; (11) No. 4, £15, Chemistry, Physics, and Biology; (12) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (13) Kirkes Scholarship, £30 and medal, Clinical Medicine; (14) and (15) two Brackenbury Scholarships, £39 each, one in Medicine and one in Surgery; (16) Sir G. Burrows Prize, 10 guineas, Pathology; (17) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; (18) Matthews Duncan Medal and Prize, £20, Midwifery and Gynæcology; (19) Luther Holden Research Scholarship in Surgery, awarded by election, £105; (20) Lawrence Research Scholarship and Gold Medal in Pathology, awarded by election, £115; and (21) Baly Scholarship in Clinical Medicine, £75, awarded by examination.

The recreation ground of 10 acres, for the use of the members of the Students' Union, is at Winchmore Hill. The Union's premises at the Hospital contain a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range. Athletic amenities are also available on the new site in Charterhouse-square.

Charing Cross Hospital

The Hospital, to which the School is attached, contains 300 beds. The School has just celebrated its centenary, accompanied by a public appeal for £50,000 which is still open. The facilities offered are complete. In addition to a full complement of medical and surgical beds, there are special departments for mental diseases, midwifery, diseases of women, of children, of the skin, ear, throat, nose, and teeth, for orthopædic cases, X ray work, and for electrical treatment. The Casualty Department deals with an average of 20,000 new cases each year. Every student holds appointments as Clerk or Dresser in every department. In the medical school demonstratorships and assistant demonstratorships are open to students of the school. Eight house physicians, six house surgeons, two obstetric and gynæcological house surgeons, six house surgeons to the special departments, two resident anæsthetists, and four clinical pathologists are appointed annually. The following Senior appointments are open to students after they have held resident appointments: resident medical officer, at a salary of £400 per annum; resident casualty officer, at £200 per annum; and five registrars to the medical, surgical, obstetrical, and ear, nose, and throat departments.

Primary and Intermediate students receive their lectures and practical work at King's College, and final studies are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged in general and special subjects.

In the Institute of Pathology, under a whole-time staff of scientific workers and in fully equipped laboratories, students receive their training in preventive medicine, pathology, and bacteriology. There are special facilities for research, and post-graduate teaching is available. The course in practical ophthalmology is given in the Royal Westminster Ophthalmic Hospital. Courses in general medicine, surgery, and pathology, with the requisite clinical work in the wards and out-patient departments, are provided for students reading for dental qualifications.

The pathological museum, containing over 4000 specimens and 3000 histological preparations, comprises (1) the section on general pathology, and (2) the Cuthbert Lockyer Collection of over 1150 gynæcological and obstetrical specimens. The library contains 3950 volumes including the latest editions of text-books.

Scholarships and Prizes are offered annually: (*a*) for students commencing medical studies—two scholarships, each of the value of £50; (*b*) for students commencing clinical studies—two "University" scholarships, each of the value of £120, in Pathology; one "University" scholarship value £120, and one "Open" scholarship, value £75, in Anatomy and Physiology. There are a number of Exhibitions, and the following prizes are offered: (1) "Llewellyn" Prize, £25, for highest distinction throughout the final course of studies; (2) "William Travers" Prize, £15; (3) "J. H. Morgan" Prize, £10; other prizes in money are the "Pereira," "T. H. Green," and "Stedman," while prizes in money are offered for proficiency in clinical medicine and surgery, and all the different subjects of the curriculum.

The Students' club, with smoking and luncheon rooms on the school premises, cloak room, telephone, &c., provides for the social comfort and convenience of the students. The club is controlled by a committee of students, and includes the Medical Society and the Dramatic Society. The *Gazette* is published quarterly. The sports ground, of 8 acres, at Colindale affords facilities for Rugby and Association football, cricket, hockey, and tennis (hard and lawn courts). In addition there are sections of the club devoted to athletics, boxing, swimming, golf, and badminton.

St. George's Hospital

Plans are being prepared for the complete re-building of the whole of the Hospital and Medical School on its present site, and it is hoped that the new hospital will contain at least 450 beds and a much larger Medical School. In the meantime the work of the Institution will be continued unaltered.

This hospital has now a service of 436 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. There are all the usual special clinical departments. One ward is set apart for diseases peculiar to women, and there is a maternity ward of 13 beds. One ward is set apart for the medical diseases of children. There are two ophthalmic wards.

Eight house physicians, ten house surgeons, and eight casualty officers are appointed annually. They are provided with board and lodging in the hospital and receive honorariums of £40 per annum. In addition the following appointments are open to all qualified students of the hospital: resident assistant physician at £250 per annum; medical officer to the Atkinson-Morley Convalescent Hospital at £300 per annum; medical registrarship at £200 per annum; two surgical chief assistants (resident) at £225 per annum; assistant curatorship of the museum at £100; obstetric assistantship (resident) at £100; the post of resident anæsthetist at £100.

The teaching and laboratories are devoted to clinical subjects, and arrangements have been made with the authorities of King's College and University College for students who enter the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at one of those Colleges. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Scholarships and Prizes.—At this school 11 entrance scholarships and exhibitions are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two William Brown Exhibitions, £120 and £80 respectively; (*c*) and (*d*) two Anne Selina Fernee Scholarships, £80 each; (*e*) Devitt-Pendlebury Scholarship, £40 (approx.); (*f*) and (*g*) two Anne Selina Fernee Exhibitions, £60 each, Anatomy and Physiology, except in the case of (*c*) and (*f*) subject of examination for which is General Pathology.

In addition to the above, Exhibitions each of the value of £40 and up to four in number may be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (*h*) Allingham Scholarship in Surgery for Students qualified not more than two years, £87; (*i*) and (*j*) two Brackenbury Prizes, one in Medicine and one in Surgery, £33 each, open to students of not more than five years' standing; (*k*) H. C. Johnson Memorial Prize, £20, Practical Anatomy; (*l*) Pollock Prize, £24, Physiology, Physiological Chemistry, and Histology; (*m*) Clarke Prize, £5; (*n*) Thompson Medal, £9, Clinical Reports; (*o*) Brodie Prize, £8, Clinical Reports; (*p*) Webb Prize, open to perpetual pupils, £34, Bacteriology; (*q*) Sir Francis Laking Memorial Prize, £45, open to students having registrable qualifications.

The Library is fully stocked with the latest and best text-books. The Pathological Museum has recently undergone complete revision. In addition to its well-known specimens of great historical interest, it contains a complete range of pathological conditions, set out in such a way that the student can easily obtain the fullest information relating to any disease.

The St. George's Hospital Club, with smoking- and luncheon-rooms on the hospital premises and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the Rugby football, cricket, lawn tennis, boxing, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Guy's Hospital

The Medical School, which has been entirely rebuilt within recent years, provides ample accommodation with modern equipment for all the subjects of the medical curriculum. The Hospital contains 647 beds. On commencing the clinical period, students are placed for three months under the charge of an experienced clinical tutor while they are given a preliminary course of instruction in methods of clinical examination. Thereafter they hold a series of appointments, each of three months' duration, in the surgical, medical, and obstetrical and gynæcological wards.

The following special departments are attached to the hospital: Departments of ophthalmology, laryngology, gynæcology, diseases of children, diseases of the nervous system, psychological medicine, dermatology, otology, actino-therapeutics, anæsthetics, dentistry, orthopædics, vaccine, tuberculosis, genito-urinary, venereal diseases, and the Salomon's Welfare Centre (for maternity and children). There is a venereal clinic in accordance with the scheme of the Ministry of Health and the L.C.C.

House physicians, house surgeons, out-patient officers, assistant house surgeons, obstetric residents, house surgeons in the departments of ophthalmology, laryngology, and genito-urinary diseases, house physicians in the departments for neurology and dermatology and for diseases of children, and clinical assistants are appointed from among recently qualified students according to merit.

Scholarships.—Five Entrance Scholarships are awarded annually and one every other year as follows: (*a*) one War Memorial Scholarship, of the value of £200, awarded alternately in Arts and Science (next award, April, 1936, in Arts); (*b*) one Open Arts Scholarship of £100 for students under 19 years of age, awarded annually in April; candidates are required to take English and any two of the following subjects: Latin, Greek, French, German, and Mathematics; (*c*) one Open Junior Science Scholarship of £100 for students under 20 years, awarded in April; subjects any three of the following: Inorganic Chemistry, Physics, Biology, and Mathematics; (*d*) a confined Junior Science Scholarship of the value of £100 is offered for competition annually, and is open to students who have attended the Preliminary Science Classes at this School. This Scholarship is awarded on the results of the First M.B. London Examination held in July; subjects: Chemistry, Physics, and Biology; (*e*) *University Entrance Scholarships:* (1) a War Memorial Scholarship entitling the holder to free medical education for three years, awarded annually in June or July; (2) an open exhibition of the value of £60, awarded annually in June or July, for students who have completed their examinations in Anatomy and Physiology in a British School or University outside the London Metropolitan area; subjects, any two of the following: Human Anatomy and Embryology, Physiology, Pathology including Bacteriology, Biochemistry. The examination is held in common with the Medical School at St. Thomas's Hospital and the Medical College of St. Bartholomew's Hospital.

Prizes.—The following prizes are awarded annually: (*a*) Treasurer's Medal and Prize for Clinical Medicine; (*b*) Treasurer's Medal and Prize for Clinical Surgery; (*c*) Golding-Bird Gold Medal and Scholarship (£20) for Obstetrics and Gynæcology; (*d*) Golding-Bird Gold Medal and Scholarship (£20) for Bacteriology; (*e*) Charles Oldham Prize in Ophthalmology (£30); (*f*) Beaney Prize for Pathology (£34); (*g*) Leonard Lubbock Prize for Clinical Pathology (£10); (*h*) Wooldridge Memorial Prize for Physiology (£10); (*i*) Sands-Cox Scholarship in Physiology (£45)—awarded triennially; (*j*) Prizes in Anatomy and Physiology for General Proficiency of the value of £20, £15, and £10 respectively; (*k*) Michael Harris Prize for Dissections (£5).

Studentships.—The following Studentships are open to graduates from this School: (1) Gull Studentship in Pathology (approx. £250 per annum); (2) Arthur Durham Travelling Studentship (£100)—awarded triennially; (3) Beaney Studentship in Materia Medica (£60 per annum); (4) Anderson Demonstratorship in Clinical Chemistry (£175 per annum); (5) Griffiths Demonstratorship and Research Studentship in Pathology (£320 per annum); (6) Adrian Stokes Fellowship in Pathology and Bacteriology (£300)—awarded biennially; (7) Hilda and Ronald Poulton Fellowship (£150 per annum).

The Wills Library contains 10,000 volumes of standard text-books and books of reference, the Museum contains upwards of 5000 specimens of pathological anatomy, supplemented by more than 2000 drawings.

Within the grounds of the hospital are situated the residential college, with accommodation for 35 students, the students' club, with reading, smoking, luncheon, and dining-rooms, a squash court, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 15 minutes from the hospital.

King's College Hospital

Instruction for the preliminary and intermediate examinations is given at the College.

The new medical school at Denmark-hill, opened in July, 1933, contains the Museum, Research Laboratory, Research Rooms, Common Rooms, Lecture Rooms, Refectory, and two Squash Rackets Courts. Provision is made for all the subjects of the medical curriculum. In the education at the hospital a special feature has always been the individual attention given to each student. The studies are coördinated under the direction of senior members of the honorary staff, assisted by medical, surgical, obstetric, and pathological tutors. Twelve women medical students are admitted annually.

The numerous appointments open to students are those of clinical assistant to the general and special departments; medical, surgical, obstetric, and pathological tutorships; resident casualty officers, house physicians, and house surgeons; resident anæsthetist; resident radiologist; bacteriologist; clinical pathologist; pathological; medical, surgical, obstetrical, and other registrarships. Thirty-one resident medical and surgical officers are appointed each year.

Post-graduate Courses.—Two advanced medicine and two advanced surgery courses are held annually, and are suitable for preparation for M.D., M.S., M.R.C.P., and F.R.C.S. Examinations.

An Evening Course for medical practitioners and senior students is held throughout the winter at 9 P.M. on Thursdays.

An Intensive Course is held on the first Saturday and Sunday of the winter session for qualified members of the School and other practitioners.

Scholarships.—Those in connexion with King's College have already been enumerated. Scholarships of the total value of £1530 are awarded annually. These include: (*a*) Medical Entrance Scholarships—Science, £75; Anatomy and Physiology, £75; Pathology, £75; (*b*) two Burney Yeo Entrance Scholarships, £105 each, open to students of Oxford and Cambridge on the recommendation of the Regius Professors; (*c*) two Raymond Gooch Scholarships, £105 each, open to students of British Universities on certain conditions; (*d*) Epsom College Scholarship, value £100, offered annually to a student of Epsom College who has taken the first part of the courses for Medical Degrees at the Universities of Oxford, Cambridge, or London; (*e*) two Seaman Scholarships, each £50 a year for a period not exceeding five years, restricted to the sons of clergymen of the Church of England; (*f*) Senior Scholarship (Clinical Studies), £40. The holders of the Warneford and Sambrooke Scholarships take the subjects of the preliminary and intermediate examinations at King's College, and the final subjects at King's College Hospital.

Prizes.—Tanner Prize, £10, Obstetrics and Diseases of Women; Todd Prizes, first £8 and medal, second £4, for Clinical Medicine; Burridge Prize, £4 4s., Forensic Medicine; Jocelyn Almond Prize, £5 5s., Diseases of Children; Wallis Prize, £10, Dental Surgery; The Ferrier Prize in Neurology, Bronze Medal and £20; The Legg Prizes in Surgery and Surgical Pathology, Ware Prize for General Pathology, Cheyne Prize for Surgery. Special Prizes for Diseases of Children, Orthopædic Surgery, and Urology. Thirteen Class Prizes of £3.

Clubs, Hostel, Athletic Ground.—The King's College Hospital Clubs and Societies Union consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. The athletic ground, over six acres in extent, is on Dog Kennel Hill, about ten minutes' walk from the hospital. There are also tennis courts in the grounds of the hospital and of "The Platanes"—the residence for students on Champion Hill. The Library contains 7000 bound volumes in addition to the medical and scientific periodicals. There are good facilities for quiet reading and books are lent for use at home.

London Hospital

The hospital, with its Medical College and Dental School, contains 875 beds. Its neighbourhood to the extensive docks, factories, and workshops of the east of London is unrivalled, and presents an immense field for clinical instruction. There are special departments for the treatment of diseases of children, the eye, ear, nose and throat, skin and teeth. In addition there are departments devoted to gynæcology and obstetrics, orthopædics, cardiology, neurology, neurosurgery, radiology, electro- and physico-therapeutic light therapy, radium, and vaccine therapy.

A Clinical Unit in medicine, under the charge of a whole-time director, provides for the more elaborate methods of diagnosis and treatment, and takes a leading part in the initiation and coördination of medical research. The director has an assistant director, two assistants, and two house physicians.

To each medical and surgical firm throughout the hospital there is attached a first assistant, who is responsible for instructing the clerks or dressers of the firm in elementary medicine and surgery, and who assists the honorary members of the firm in the preparation of their demonstrations. In the department of obstetrics and gynæcology there is a first assistant and two resident accoucheurs. In the department for children's diseases there is a first assistant, a house physician, and two clinical assistants. Special courses of lectures and demonstrations are arranged in medicine and surgery and their ancillary subjects. Opportunities for research are provided under the supervision of the staff.

Many appointments are open to students before and after qualification, and holders of resident appointments have free board. Special classes are held for the examinations of the University of London, for the Fellowship of the Royal College of Surgeons, for the Membership of the Royal College of Physicians, and for other higher examinations. Special entries for medical and surgical practice can be made.

The salaried appointments open to past students of the hospital are those of assistants to the medical unit; first assistants to the medical and surgical firms; assistants to the departments of obstetrics and gynæcology; clinical assistants in the medical, surgical, ophthalmic, aural, light and skin, orthopædic, neurological, neurosurgical, and electrical departments, and in the institute of pathology and clinical laboratory. There are appointed annually 4 resident accoucheurs, 16 resident house physicians and 19 resident house surgeons, 14 resident receiving-room officers, 8 resident emergency officers, 8 clinical assistants to the medical out-patient department, and 16 clinical assistants to the surgical out-patient department, also paid and unpaid clinical assistants in the various special departments.

Scholarships and Prizes.—Entrance Scholarships: Price Scholarship £100, subjects of First Medical Examination at the University of London; Epsom College Scholarship, free education, subjects of First Medical Examination as above; Scholarship of £50, in certain subjects of the Preliminary Examination in General Education; Price Scholarship, open to students of Oxford and Cambridge Universities, £100, Human Anatomy and Physiology; two Open Scholarships, each of the value of £100, subjects, Human Morphology and Embryology, Physiology and Pharmacology, Biochemistry, Pathology, Bacteriology, and Morbid Anatomy. Prizes: Buxton Prize, £40, subject of Anatomy and Physiology; H. L. B. Haking Prize in Clinical Obstetrics and Gynæcology, £25; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine and Surgery; Letheby Prizes (2), £25, Chemistry and Chemical Pathology; four Dressers' Prizes, amounting to £20, zeal, efficiency, and knowledge of Elementary Clinical

Surgery; Hutchinson Prize, triennial, £60, Clinical Surgery; Treves Prize, £20, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 respectively; Andrew Clark Prize, £14, Clinical Medicine and Pathology; T. A. M. Ross (Prox. Acc.) Prize, £10 10*s.*, Clinical Medicine and Pathology; James Anderson Prizes (4), £20, Elementary Clinical Medicine; Arnold Thompson Prize, £15, Diseases of Children; and Liddle Prize, triennial, £120.

Medical Research Funds.—Funds to the value of over £113,000 permit of financial assistance being given to students and graduates engaged in Medical Research.

A laboratory for the manufacture of certain preparations of Radium has recently been endowed.

A new Residential Hostel has been opened and provides accommodation for upwards of 50 students. The hostel includes a library, writing, common, and dining rooms, and two squash racket courts. There is also a hostel for resident medical officers. The Union Athletic Ground, 13 acres, is within easy reach of the hospital.

St. Mary's Hospital

The Hospital and Medical School have on one side a poor district of 500,000 persons, one-tenth of whom, on an average, pass through the hospital annually. On the other side are the residential districts of Kensington and Bayswater, making it possible for the student to live in touch with his work.

The hospital contains 384 beds, and recent structural additions have added two new operating theatres. By a scheme of affiliation, for teaching purposes, of certain neighbouring hospitals the teaching facilities extend over 1000 beds. The medical school provides courses of instruction for the teaching of the entire curriculum, and students can join at once on passing a preliminary examination in arts. Terms begin in October, January, and April.

Clinical Units in medicine and surgery were established in 1920. Under this system professors of medicine and surgery, with competent assistants, give their whole time to teaching and research. The system also provides additional salaried posts which are open to students after qualification.

The hospital has lying-in beds to which considerable additions have recently been made, and in addition to the instruction thus obtained each student attends a short course at Queen Charlotte's Hospital, as part of his training in Midwifery, without additional fee.

Students specially interested in Pathology and Bacteriology have singular advantages at St. Mary's. The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright. Research Scholarships of £200 each are awarded annually to students working in the departments, and research beds have been instituted. Clerkships in pathology, bacteriology, and chemical pathology, lasting for a period of three months, are open to students of the fifth year and enable them to carry out the pathological and bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually. Numerous appointments are open to newly qualified members of the medical school, including seventeen salaried posts with salaries varying up to £750 per annum. A special post-graduate course is held during the first week-end in October, and is open to all general practitioners and other qualified men without fee.

Entrance Scholarships.—From three to five Entrance Scholarships are awarded annually by nomination.

The Medical School and Institute of Pathology have been recently rebuilt at a cost of nearly £250,000. The buildings include a Students' Club and Restaurant with a swimming bath which opens on to a courtyard beneath which is a garage for 50 cars. There is a squash rackets court and gymnasium with a boxing ring.

The athletic ground (10 acres) is situated at Wembley and can be reached in 20 minutes by a constant service of trains.

Middlesex Hospital

The hospital and cancer wing contain over 560 beds, with special wards for cancer, maternity, gynæcological, otological, neurological, dermatological, and ophthalmological cases, and for diseases of children. Other special departments include those for diseases of the eye, ear, nose and throat, and skin; nervous diseases, orthopædic cases, diseases of the rectum, and venereal diseases. There is also an electrotherapeutic department and a department of radium therapy and research. Early in 1935 the Clinical Research Unit, known as the Courtauld Wards, was opened for the reception of patients upon whom investigations of a pathological, physiological, or biochemical nature are conducted. The cancer wing, containing 90 beds and special investigation laboratories, offers unrivalled opportunities for the study of cancer, both in its clinical and pathological aspects. In the electrotherapeutic department, students obtain instruction in the treatment of lupus and cancer by the X ray method of treatment.

The following appointments are made at intervals annually: eight house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, one senior resident anæsthetist, two junior resident anæsthetists, four resident officers to the special departments, two dental house surgeons, and one clinical assistant to the Courtauld Wards. Nine registrars are appointed annually. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department.

The medical school, which includes the Bland-Sutton Institute of Pathology, the Courtauld Institute of Biochemistry, the Barnato-Joel Laboratories, and the Ferens Institute of Otology, is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum and the University diplomas in radiology. Ample laboratory and class-room accommodation is provided. The teaching staff includes 6 professors, 2 university readers, 40 recognised teachers, 10 demonstrators, 4 tutors. The Bland-Sutton Institute of Pathology and the Courtauld Institute of Biochemistry are completely equipped for routine hospital investigations, teaching, and research work, and contain large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped anatomical and pathological museum and reference library offer every facility.

Other features of interest are: the course in medical radiology and electrology, under the direction of the "Joel" Professor of Physics and Dr. Graham Hodgson. Primary F.R.C.S. courses are held twice yearly.

Scholarships and Prizes.—Two Entrance Scholarships, value £100 each, and four University Scholarships, value £100 each, are awarded annually. The successful candidates are required to become general students of the school. A Freer Lucas Scholarship is awarded annually on the nomination of the Head-master of Epsom College. There are also two Broderip Scholarships, value £60 and £40 respectively; the Lyell Gold Medal and Scholarship, value £55 5*s.*; the John Murray Medal and Scholarship, value £25 (awarded every third year); the Freeman Scholarship, value £30; the Hetley Clinical Prize, value £25; the Kingston Fowler Prize, value £15; the Leopold Hudson Prize, value 11 guineas; and the Colin Mackenzie Prize, value 10 guineas. There are numerous class prizes.

The Students' Amalgamated Clubs include the following: Medical Society, Common Room Society, Musical Society, cricket, football, rowing, chess, lawn tennis, hockey, sailing, golf, fencing, and swimming. There are a restaurant and a gymnasium in the school buildings, and athletic grounds at N. Wembley. Squash rackets are also available.

St. Thomas's Hospital

This hospital consists of eight linked-up pavilions, the medical school building being separated from the hospital by a quadrangle; the school buildings comprise the department of anatomy with its lecture theatre, museums, research laboratory, and completely equipped X ray department, erected in 1935; the Sherrington School of Physiology, and a newly rebuilt department of chemistry with physical and biological laboratories. The hospital contains 644 beds and, in addition, has 30 beds at the Pyrford Orthopædic Hospital and 22 beds at the St. Thomas's Babies Hostel; there are teaching facilities for a further 150 beds, while students profit by liaison with Lambeth Hospital, where demonstrations are arranged at regular intervals and senior students attend with facilities for clinical work. There is a Clinical Unit in medicine under a whole-time director, with laboratories and reading-room attached.

A complete curriculum is provided for students, the hospital having departments for the treatment of all the specialties. Particular attention is given to antenatal instruction and the teaching of diseases of children. A tuberculosis department in the hospital forms part of the Lambeth anti-tuberculosis scheme. The V.D. department is part of the L.C.C. scheme. In each department much clinical material is available. Instruction in anæsthetics takes place during appointment as dresser. Private coaching facilities are available and classes for the Primary F.R.C.S. Eng. are held. Revision classes are held in anatomy and physiology in accordance with the medical curriculums of Oxford and Cambridge. The obstetric training of students is supplemented by an arrangement with St. James Hospital, Balham, whereby throughout the year two students at a time are in residence and take part in the maternity work. A special maternity ward of the hospital gives the student scope for elementary training before he undertakes cases in the district. In addition to the usual routine as clerk and dresser, every student works for a period of three months at the Medical Unit of the hospital. The post-mortem room, rebuilt in 1932, has a large amphitheatre adapted for teaching purposes and for the intimate study of morbid pathology.

The following appointments are open to students: A resident assistant physician and a resident assistant surgeon, salary £225 each per annum, and a resident anæsthetist, salary £200 per annum, are appointed annually. The assistants in the medical and surgical units hold appointments with a maximum tenure of four years. These officers are salaried. Three medical and four surgical registrars at a salary of £250 hold their appointments on a tenure renewable to a maximum of four years. A pathological registrar to the department of obstetrics and gynæcology (at an annual salary of £250), an ophthalmic registrar (at an annual salary of £200), and an orthopædic registrar (unpaid) are appointed yearly. Nine chief assistants (unpaid) are appointed to the special departments. Eight resident casualty officers and anæsthetists are appointed every six months. Seven house physicians (including two obstetric house physicians and one house physician to the department of diseases of children), nine house surgeons (including two ophthalmic house surgeons, one orthopædic house surgeon, and two house surgeons to the ear, nose, and throat department) are appointed every six months. Clinical assistants in the special departments are appointed every three months, and hold office for six months if recommended for re-election. There are three assistants in the department of pathology; the senior receives £600 a year, and the two juniors £450 each.

Scholarships and Prizes.—At this school there are the following Entrance Scholarships: Two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in any two of the following—Anatomy, Physiology, Pathology, Chemistry; also the "Hector Mackenzie" University Exhibition of the value of £60. The value of all entrance scholarships is taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (*a*) William Tite Scholarship for second-year students, £25; (*b*) and (*c*) Musgrove Scholarship or (alternately) Peacock Scholarship each for third-year students and tenable for two years, £35 each; (*d*) Mead Medal, Medicine, Pathology, and Hygiene; (*e*) Wainwright Prize, Medicine; (*f*) Toller Prize, Medicine; (*g*) Cheselden Medal, Surgery and Anatomy; (*h*) Clutton Memorial Medal in Clinical Surgery, biennial; (*i*) Beaney Scholarship, £50, biennially, Surgery and Surgical Pathology; (*j*) Solly Medal and Prize, biennial, Reports of Cases; (*k*) Sutton Sams Prize, biennial, Report of Cases; (*l*) Bristowe Medal, Pathology and Morbid Anatomy; (*m*) Hadden Prize, Pathology and Morbid Anatomy; (*n*) Grainger Testimonial Prize, £31 10*s.*, Anatomy and Physiology; (*o*) Louis Jenner Research Scholarship, tenable for two years, £60 annually, Pathology; Perkins Research Fellowship, £40–£100; Myers Prize in Psychological Medicine, £10 10*s.*

In the school buildings are a reading-room and library, containing approximately 8500 volumes. There is here a selection of new editions of current text-books, and periodical literature suitable to the needs alike of students and research workers. The Shattock museum, which forms part of the buildings, contains over 5000 preparations, illustrating all morbid lesions of importance, an illustrative type series, and many specimens of historical interest. In the west wing of the school are the pathological institute and photographic department.

Opposite the hospital is St. Thomas's House, the premises of the amalgamated clubs, providing all the usual amenities and having squash courts, a miniature rifle range, and ample garage accommodation. There is a hard tennis court in the quadrangle. A hostel in the same buildings accommodates 50 resident students. All field games are provided for and there is a sports ground at Chiswick with one of the best cricket pitches in the country.

University College Hospital

Instruction in the preliminary scientific subjects is given at the College. The final subjects in the curriculum are taught at the medical school of the hospital, which has 540 beds, including 85 in the new obstetric hospital. Clinical Units in medicine, surgery, and obstetrics and gynæcology are now in operation. The whole-time directors of the Units are concerned with the organisation of the teaching generally, but the honorary staff are responsible for the largest share of the teaching in the wards and out-patient department of the hospital. The department of otology, rhinology, and laryngology (the Royal Ear Hospital) has been provided with a separate building in Huntley-street, adjacent to the obstetric hospital. It contains 41 beds, including eight private wards for patients of limited means. In the dental school in Great Portland-street there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

The hospital is equipped with all modern appliances for investigation. The new buildings of the obstetric hospital of 85 beds (rendered possible by the Rockefeller Benefaction), the new residents' house (with accommodation for 30 residents and students), the extension to the nurses' home, and new research laboratories for the medical school are now finished and in full occupation. Twelve women students are admitted annually.

Original research in all subjects can be pursued in the laboratories of the school under the professor of pathology, and students can receive grants under certain conditions from the Charles Graham Medical Research Fund.

Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the medical school and hospital. Sixteen house physicians, ten house surgeons, ten obstetric assistants, four house surgeons to the Royal Ear Hospital, are selected annually by examination from among the senior students who have a medical qualification. All house officers reside free in the hospital. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: resident medical officer, surgical registrar, medical registrar, obstetric registrar, Harker-Smith cancer registrar, ophthalmic registrar, registrar to the Royal Ear Hospital, radiological registrar, casualty medical officer and a casualty surgical officer, first assistant in the children's department; assistants in ear, nose and throat, ophthalmic, skin, and venereal diseases departments and in the department of psychological medicine, and house anæsthetist.

Assistants to Medical, Surgical, and Obstetric Units. These salaried appointments are for senior students who may desire to remain at Hospital after holding the ordinary resident appointments continuing clinical work or pursuing laboratory or other research. The salaries range from £250 up to £900 a year, resident quarters being provided only for the chief assistant to the Obstetric Unit. The total number of such assistantships varies from time to time, being generally about 12, and an aggregate sum of about £5000 annually is available for their salaries.

Scholarships and Prizes (those in connexion with University College have already been enumerated).—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows: (*a*) Entrance Scholarship, Bucknill, 60 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Scholarships entitling the holder to the Final Course of Medical Study, two of the following subjects: Anatomy, Physiology, General Pathology, Biochemistry; (*e*) Goldsmid Entrance Exhibition, entitling the holder to a reduction by £80 in the fees due for the full course of Final Medical Studies, two of the following subjects: Anatomy, Physiology, General Pathology, Biochemistry; (*f*) Filliter Entrance Scholarship, entitling the holder to a reduction by £52 10*s.* in the fees due for the full course of Final Medical Studies. Students need take Pathology alone if they desire to enter for he Filliter Entrance Scholarship only; (*g*) Ferriere cholarship, value £25; (*h*) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (*i*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*j*) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (*k*) Magrath Clinical Scholarship, about £160, Clinical Cases; (*l*) Percival Alleyn Scholarship, about £110, Surgery; (*m*) Filliter Exhibition, £30, Pathology; (*n*) Erichsen Prize, £21, Practical Surgery; (*o*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*p*) two Liston Gold Medals for Clinical Surgery; (*q*) Alexander Bruce Gold Medal for Pathology and Surgery; (*r*) Tuke Silver and Bronze Medals for Pathology; (*s*) Radcliffe Crocker Travelling Scholarship for Dermatology; and (*t*) Leslie Pearce Gould Travelling Scholarship for Surgery. A limited number of Bursaries are available from the Atchison Fund, awarded at the discretion of the Dean, to enable students whose means do not allow to take Resident Posts.

The Museum of Pathological Anatomy is open for study daily. The Anatomical Museum of the University of London, University College, is open to all students of University College Hospital and medical school on the recommendation of the school committee. The library, open daily to every student of the School, contains about 30,000 medical works, including all the current text-books and works of reference.

The Medical Society exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the medical school are required to become members, and meetings are held once a fortnight for appropriate discussion connected with the study of medicine. The Society includes various athletic clubs and superintends the gymnasium and squash racquet courts in the medical school, and the athletic ground at Perivale.

In Gower-street there is a well-equipped residential hostel solely for the use of the medical students.

Westminster Hospital

The Hospital contains 241 beds, and has attached to it a Radium Clinic with 22 beds, elaborately equipped for all forms of radium therapy and research. There are separate departments for diseases of the eye, skin, teeth, ear, nose and throat, for orthopædic practice, for diseases of women, for diseases of children, for radiography, for anæsthetics, for venereal disease, and for massage, electrical, and light treatment. The anatomical, pathological, and materia medica museums are open to all students of the school.

The entire teaching of the hospital is devoted to the subjects of the Final Examinations. Arrangements are made for the tuition required for Preliminary and Intermediate subjects.

Paid appointments as medical, surgical, and obstetric registrars, casualty officers, house physicians, house surgeons, and anæsthetist are available for students when they have passed their examinations.

There are excellent opportunities for research work in the recently endowed John Burford Carlill Laboratories. Grants to assist research workers are made annually from the John Burford Carlill Endowment.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £75 each. Summer Session: Two Scholarships in Anatomy and Physiology, £75 each. Four Scholarships in Chemistry, Physics, and English Essay, £75 each. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, Reports on Cases; Chadwick Clinical Surgery Prize, Reports on Cases; Chadwick Prize in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederick Bird Medal and Prize, open to fourth-year students, medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology, a paper and tests in practical work; Hanbury Prize in Diseases of Children; Alfred Hughes Memorial Prize, open to second-year students, books or instruments—Anatomy; Huxley Memorial Prize, open to second-year students—Physiology; Carter Gold Medal and Prize for Botany, open to students of not more than three years' attendance, gold medal and books; Jelf Medal awarded to third-year students; Daniell Scholarship, £40, Chemistry; Rabbeth Scholarships open to first-year students; Class Examinations in the Preliminary Scientific Course. Ischley Prize in Pharmacology, open to students who within two years of passing the first examination for medical degrees have completed the course in Pharmacology. Hare Prize in Zoology, open to first-year students.

The annual fee includes membership of the Sports Union Club with its various branches—i.e., football, cricket, tennis, hockey, boxing, fencing, swimming, and Guthrie Society. The athletic grounds are situated in Tooting and are reached in 20 minutes from the hospital.

London (Royal Free Hospital) School of Medicine for Women

The Royal Free Hospital contains 315 beds. The Hospital also has large casualty and out-patient departments. A new block has recently been completed to extend the special departments for orthopædic, light, and obstetric and gynæcological out-patients. Maternity districts are attached to the Obstetric Unit operating in the Gray's Inn-road and Essex-road areas. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital, Queen-square, South London Hospital, and Central London Ophthalmic Hospital. Students after qualification can hold posts at the Royal Free Hospital of house physicians, house surgeons, obstetric assistants, clinical assistants, assistant anæsthetist and pathologist, and medical, gynæcological, and surgical registrars; and the posts of demonstrators in all the departments at the Medical School.

A Clinical Unit in Obstetrics controls 68 beds. The Pathology Unit has been extended and spacious new quarters are now available.

Courses are arranged for the Primary Fellowship Examination of the College of Surgeons.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments. Students' Chambers are provided in the neighbourhood of the school and the Warden can be consulted on the subject.

Scholarships and Prizes.—Among the larger of these awards are the following: (*a*) Isabel Thorne and A. M. Bird Scholarships of £30 a year for six years; (*b*) St. Dunstan's Medical Exhibition, £60 a year for three or five years; (*c*) Mrs. George M. Smith Scholarship, £50 a year for three or five years; (*d*) Bostock Scholarship, £90 a year for five years; (*e*) Mabel Sharman-Crawford Scholarship, £20 a year for four years; (*f*) Sir Owen Roberts Scholarship, £75 a year for four years; (*g*) Fanny Butler Scholarship, £16 a year for four years; (*h*) Sarah Holborn Scholarship, £20 a year for three or five years; (*i*) Dr. Margaret Todd Scholarship, £37 a year for four years; (*j*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, £25 a year for four years; (*k*) Alfred Langton Scholarships, £35 a year for two years; (*l*) Flora Murray Bursary, awarded every year to a fifth-year student, £50; (*m*) A. M. Bird Clinical Scholarship, £30 a year for three years; (*n*) School Jubilee Bursary, £50 a year for three years; (*o*) John Byron Bursary, £20 for two years; (*p*) Helen Prideaux Prize and Julia Ann H. Cock Prize, to be spent in assisting the newly qualified holder to further study, £60 each; (*q*) A. M. Bird Post-graduate Scholarship in Pathology, £200 for one year; (*r*) Mabel Webb and A. M. Bird Research Scholarship, £200 for one year; (*s*) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, open to all medical women, preferably coming from India or going to work in India. The Dorothy Chick Gift, £14, and other prizes value £84 are awarded annually. The Students' Union arranges the social, athletic, and other clubs and societies.

Inquiries may be addressed to the Warden and Secretary of the Medical School, 8, Hunter-street, London, W.C.

British Postgraduate Medical School

The school, which was opened by H.M. the King in May last, is the outcome of joint action by H.M. Government, the University of London, and the London County Council. The School is being run in connexion with the London County Council Hospital at Hammersmith, which has at present some 400 beds, a number which is likely to be increased at a later date. Parliament voted £100,000 for its new buildings and equipment, and the London County Council is spending a similar sum on additional hospital buildings and equipment in order to improve the supply of clinical materials for teaching.

The school, of which the buildings are now substantially completed, is situated in the grounds of the Hammersmith Hospital at Ducane-road. These grounds cover 14 acres and provide ample room for further building. Ducane-road runs parallel to Western-avenue, to the south of a large area of open ground known as Wormwood Scrubs, which can never be built over. On the west lies the prison, and the extensive plot on the east belonging to St. Clement Danes Grammar School will also remain open.

The Board of Governors of the Postgraduate School, as prescribed in its Charter, is made up of representatives of various interested bodies, and at present consists of 17 members under the chairmanship of Sir Austen Chamberlain. These are nominated by the Secretaries of State for Dominion Affairs, India, and the Colonies, the Ministry of Health, the London County Council, the University of London, the English Royal Colleges, the Society of Apothecaries of London, the Royal Society of Medicine, and the British Medical Association; three additional Governors are coöpted.

The school has been provisionally recognised as a school of the University of London, and all appointments of Professors and Readers are made by that body. It is open equally to men and women.

Facilities are provided for at least three different classes of post-graduate student: (1) students from the Empire and abroad who at present have scarcely any opportunity of sharing in practical work in this country; (2) those who have qualified at one or other of the British undergraduate medical schools and feel a desire for further scientific training; (3) practitioners, especially those from the country, requiring short and highly concentrated refresher courses to keep them in touch with new developments in medicine and surgery.

The new block, in which is housed the medical school, consists of three floors around a central courtyard. On the ground floor is the clinical theatre, with seating room for 100 students, directly abutting on the main east-west corridor of the hospital, with a room for a cinema operator on the one side and examination rooms for patients on the other. On the north side of this floor is a very complete morbid histology department. On the first floor are the library and museum, as well as the lecture theatre which lies over and duplicates the clinical theatre below.

The following senior appointments to the school have been made: Dean, Colonel A. H. Proctor; Professor of Medicine, Dr. F. R. Fraser; Professor of Obstetrics and Gynæcology, Dr. James Young; Professor of Pathology, Dr. E. H. Kettle; Professor of Surgery, Mr. G. Grey Turner. Visiting experts are invited to conduct special courses from time to time, and that, while ample opportunity for refresher courses is to be provided, advanced workers will find their needs considered.

The first two refresher courses were held respectively in June and July last and further courses are to be held commencing on Sept. 16th and Nov. 18th. The subjects dealt with in these courses are selected mainly from those recommended in the British Medical Association memorandum. Each subject is dealt with by a recognised authority, assisted by the staff of the school. For the specialties visits are arranged to Special Hospitals. A course for local practitioners is being organised. Lecture-demonstrations will take place weekly at convenient times throughout the winter. A course of lectures on the Place of the Laboratory in Clinical Work will be given during the winter.

Apart from the special courses, graduates who have the time available join the school for "hospital practice and tuition." Such students attend from 10 A.M. to 4 P.M. Clinics are held daily. Students have every opportunity of examining and studying cases under expert guidance, and of receiving tuition thereon. They also attend the regular conferences between the different departments and the radiological and pathological demonstrations, which are held weekly.

At the hospital a new surgical and maternity block has been provided and a large out-patient department—this last a novel feature for one of the London County Council hospitals. It is intended to arrange that patients from any of the London County Council's hospitals may be sent to Hammersmith for the purpose of diagnosis and the specialised treatment available there.

The responsibility for the care of patients will continue to rest with the Council, and while the proper duty of the school is teaching the two functions are in practice inseparable, at least with regard to the more senior posts. The school will depend for its main income on a grant from the University Grants Committee administered through London University (which has two representatives on the Governing Body), but will also receive a payment from the Council in respect of services rendered to the hospital, and, in addition, fees are charged to students attending courses.

UNIVERSITY OF DURHAM

There are two degrees in Medicine, *M.B.* and *M.D.*; two in Surgery, *M.S.* and *D.Ch.* The University also gives degrees or diplomas in *Dental Surgery, Hygiene and Public Health, and Psychiatry.* The student's course is not likely to be altered by any action of the Statutory Commissioners under the University of Durham Act.

Medical students may prepare for the pre-registration examination in chemistry and physics at Armstrong College. Students who have taken a degree in science and wish subsequently to proceed to a degree in medicine will receive the proper exemption.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Biology and Chemistry in relation to medicine. The subjects of the Second Examination are—Anatomy and Physiology. The subjects of the Third Examination are—Pathology and Bacteriology, Materia Medica, Pharmacology and Pharmacy, Medical Jurisprudence, and Public Health. The subjects of the Fourth Examination are—Medicine, including Therapeutics, Clinical Medicine, Surgery, Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Psychological Medicine, Diseases of the Skin, of the Throat, Nose, and Ear, and of Children, and Ophthalmology. The University requires that at least three years be spent in residence in the University. In certain cases candidates may obtain exemption from the First and Second examinations, but the later professional examinations must be passed in the University.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must have obtained the bachelor degrees of the University, and been engaged for two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special examination in the subjects of Medical Anatomy, Medical Pathology, and the Principles and Practice of Medicine. The subjects of examination for the M.S. are—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Surgery.—Candidates must be registered medical practitioners, and not less than 25 years of age, and must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery, one at least to be spent in the University. The course of study of the candidate must be submitted to the Professor of Surgery and approved by the Board of the Faculty. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology, and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad.

Candidates must give six weeks' notice of entry for all examinations to the Secretary of Examinations, University of Durham College of Medicine. The M.D. (essay) must be sent in before April 1st.

Scholarships and Prizes.—The following are awarded: University of Durham Entrance Scholarship, £25 a year for four years; Pears' Entrance Scholarship, £40 a year for three years (awarded every third year); Heath Entrance Scholarship (from Kepier Grammar School), £60 (renewable); Province of Durham Masonic (Entrance) Scholarship, £60 (renewable); Heath Scholarship for Surgery, £200, available every second year; Rutherford Morison Surgical Scholarship, £180, available every third year. Approved applicants may obtain special grants for surgical research from the Stephen Scott Research Fund, and for research in asthma, &c., from the William Dodds Research Fund.

The following Scholarships are tenable for one year, namely: Tulloch Scholarship for Elementary Biology and Organic Chemistry, £20; Dickinson Scholarship for Medicine, Surgery, Midwifery, and Pathology, £20; Charlton Scholarship for Medicine, £25; Gibb Scholarship for Pathology, £28; Luke Armstrong Scholarship for B.Hy. and D.P.H. (Part I.) Examination in Bacteriology, £25; Stephen Scott Scholarships for Anatomy and Physiology, two of £50 each; Philipson Scholarships for highest marks in Final M.B., B.S. Examinations, two of £45 each; Goyder Memorial Scholarship for Clinical Medicine and Clinical Surgery, interest on £325; *Hamilton Drummond Memorial* Scholarship, in aid of research in Clinical Surgery, about £50; Gibson Prize for Midwifery and Diseases of Women and Children, £10; Turnbull Prize and Silver Medal for Surface Anatomy; and Outterson Wood Prize for Psychological Medicine, £10; Sewell Memorial Prize and Silver Medal for Clinical Pathology.

Newcastle-upon-Tyne: College of Medicine

Hospital practice and post-graduate work are carried out at the Royal Victoria Infirmary, a general hospital containing 700 beds, and there are facilities for the study of the various special subjects. Post-graduate work, as well as voluntary courses for undergraduates, can be pursued at the Newcastle General Hospital.

Practical midwifery can be studied at the Princess Mary Maternity Hospital, which contains 90 beds, with an annual indoor and outdoor attendance on 3000 cases.

Psychological medicine can be studied at the Newcastle Mental Hospital, and infectious diseases at the City Hospital, under the M.O.H. of the city.

The bacteriological laboratory is adjacent to Armstrong College.

Post-graduate Instruction.—1. General courses in Clinical Medicine, Surgery, and Pathology at the Royal Victoria Infirmary, meeting once weekly for ten weeks. One course is held from October to December and one from April to June. 2. Special courses of clinical instruction, meeting once weekly for ten weeks, in the following subjects: Gynæcology; Diseases of the Eye; Diseases of the Throat, Nose, and Ear; Diseases of the Skin; Venereal Diseases;

Neurology; Diseases of Children; Electrotherapeutics and Radiology; special courses in Midwifery are held at the Princess Mary Maternity Hospital. 3. An intensive course of 14 days' duration in the Summer Vacation. 4. In addition to the regular post-graduate courses practitioners may attend the ordinary medical and surgical practice of the Royal Victoria Infirmary, also at the Princess Mary Maternity Hospital for specified periods, and for clinical instruction at Newcastle General Hospital.

There is a well-furnished Students' Union for the students of the Newcastle Division of the University, and special accommodation has been provided for women students.

The clinical work is done mainly at the

Royal Victoria Infirmary

The Infirmary has over 700 beds. Clinical lectures are delivered by the physicians and surgeons weekly and ward demonstrations are given daily. Tutorial classes are given by the assistant physicians, assistant surgeons, the medical and surgical registrars, and the assistant to the gynæcological department, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the pathologist daily or as opportunity occurs. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching: ophthalmic, throat, nose, and ear, skin, and venereal disease, gynæcological, orthopædic, and electrical. The hospital building contains the following laboratories: 1. Special pathological laboratories attached to the post-mortem rooms. 2. Bacteriological laboratory in which all clinical bacteriological investigations are carried out. 3. There is in addition a clinical laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session of 1935 opens on Oct. 1st, and the summer session of 1936 on April 21st.

Applications for detailed information should be made to the Sub-Dean, Dr. Horsley Drummond, at the hospital.

Appointments of assistants in the pathological and other special departments and of clinical clerks and dressers are made periodically. Resident appointments are also made every six months; and each year medical and surgical registrars (who also act as tutors) are appointed from candidates who have previously held resident appointments at any recognised hospital. These latter posts afford an excellent opportunity for post-graduate study, not only at the Infirmary, but also in the departments of anatomy, physiology, pathology, and bacteriology of the college.

UNIVERSITY OF BIRMINGHAM

The University of Birmingham grants the degrees of *M.B., Ch.B., M.D., Ch.M.* There is also the degree of *Ph.D.* (for *Research Study*), a degree of *M.D.*, (*State Medicine*), and a diploma in *Public Health.* The Senate may recognise courses of study and examinations at other Universities in Physics, Chemistry, Biology, and Organic Chemistry: but at least three years must be spent in attendance upon classes in the University. The final year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof. Before commencing the study of Anatomy and Physiology, examinations in Chemistry and Physics and Biology must be passed (First M.B., Ch.B.), or examinations in lieu thereof. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. Second Examination.—Part I., Organic Chemistry; Part II., Anatomy and Physiology. Third Examination.—General Pathology and Bacteriology. Fourth Examination (at the end of the fifth year).—Forensic Medicine and Toxicology; Public Health; and Materia Medica, Pharmacology, and Therapeutics. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery and Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital three months, and mental hospital three months. Vaccination instruction must be taken and courses of Ophthalmology, Venereal and Skin Diseases, and Diseases of Ear, Nose, and Throat, Medical and Surgical Anatomy, and Operative Surgery. Distinctions may be awarded in the subjects (severally) of the Second, Third, Fourth, and Final; and First- and Second-Class Honours in the Final Examination.

Degrees of Doctor of Medicine and Master of Surgery. One year after having passed the final M.B., Ch.B. examination the candidate can present himself for these higher degrees. They present a thesis on some medical or surgical subject, and pass a general examination in Principles and Practice of Medicine for the M.D. and one in Principles and Practice of Surgery, including operations on the cadaver, for the Ch.M., or, at the discretion of the examiners, in a special branch of Medicine or Surgery respectively. A thesis of exceptional merit may exempt from any part of these examinations, in which Honours may be awarded.

Degree of Ph.D.—Candidates must possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and have been engaged as a rule in advanced study for two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. But under approved conditions after the first year research may be carried on elsewhere, when, on completing the course, candidates present a thesis and submit themselves for oral and possibly written examination.

Scholarships and Prizes.—The following are awarded:—Entrance Scholarships: (*a*) Frank Fletcher and Catherine Fletcher Scholarships of £100 per annum each, for five years. Two or more offered annually; open to men and women students under certain prescribed conditions as to residence, &c.; (*b*) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (*c*) Sands Cox Scholarship of £21 per annum during two years, awarded to the candidate, not being more than 19 years of age, taking the highest marks at the Higher School Certificate Examination of the Joint Matriculation Board; (*d*) Dental Scholarship of £46 17*s.* 6*d.*, Open Competitive Examination in subjects learned during apprenticeship; (*e*) Myers Travelling Studentship of £300, tenable for one year, offered in alternate years, awarded by vote of committee to M.B., Ch.B. candidates, tenable at some University or Hospital not in Great Britain or Ireland; (*f*) two Ingleby Scholarships of £10 each, awarded to the candidates at Final Examination obtaining highest marks in the subjects of Midwifery and Diseases of Women; (*g*), (*h*), (*i*), and (*j*) four Queen's Scholarships of £10 10s. each, awarded to the candidate taking the first place in the Second, Third, Fourth, and Final Examinations respectively, provided that the candidate's work is sufficiently distinguished; (*k*) Priestley Smith Prize in Ophthalmology, value about £6 10*s.*, is awarded annually to the student passing the Final M.B., Ch.B. Examination on first entry who shows the best knowledge of Ophthalmology, provided the Examiners deem him worthy of this distinction; (*l*) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (*m*) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases. The "Arthur Foxwell Memorial Medal" (Gold Medal) is awarded annually to the candidate taking the highest place in Clinical Medicine and passing the Final M.B., Ch.B. Examination in June; the "Sampson Gamgee Memorial Medal" (Gold Medal for Surgery) is awarded annually to the best candidates passing Final M.B., Ch.B. Examination in June in Surgery (paper, oral, and clinical); the Leith-Neumann Prizes for Pathology, £10 (Medical) and £5 (Dental), are offered annually on the year's work and examinations; Peter Thompson Prize for Anatomy (Third Year); Bertram Windle Prize for Special Work in Anatomy (value about £9); and John Barritt Melson Gold Medal for Physiology (Third Year). The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in fourth and fifth years. open to all students.

Post-graduate Instruction.—A "William Withering Lectureship" has been established. Courses of lectures are given annually for post-graduates on subjects chosen from year to year (no fee). Post-graduate courses of clinical demonstrations for general practitioners are arranged annually by the University Clinical Board (April to July) at the Birmingham United Hospital (General and Queen's) and the Children's Hospital.

The students receive clinical instruction by attending the amalgamated practice of the General Hospital, Queen's Hospital, Maternity Hospital, Children's Hospital, Birmingham and Midland Eye Hospital, Mental Hospital, and Fevers Hospital, under the direction of the University Clinical Board. Appointments are open to students varying from £40 to £200 a year.

Queen's Hospital

There are 333 beds. Ward rounds and out-patient clinic classes are held daily, and regular tutorial classes throughout the session. *Post-graduate* courses arranged by the University are conducted every year. There are special departments in gynæcology, diseases of the eye, of the ear, nose, and throat, dentistry, dermatology, radiology, pathology, bacteriology, iochemistry, physiotherapy, electrocardiography, nd there is a psychiatric clinic associated officially with the Birmingham Mental Hospitals. There are also large wards for midwifery and postnatal cases, a nursery for instruction in infant welfare, an extensive midwifery distric[illegible] and residential facilities for students. There a[illegible] 29 resident appointments (inclusive of regist[illegible]) available each year for recently qualified st[illegible]ts.

Birmingham Gen[illegible]spital

There are 487 bed[illegible] [illegible]ecial wards for children, gynæcological, ear an[illegible] [illegible]oat, venereal, and radium cases; special beds f[illegible] [illegible] and skin cases. Laboratories for bacteriology, [illegible]emistry, cancer research, and morbid histology. [illegible]arate rooms adjoin the medical and surgical [illegible] for clinical pathology. Six operating theatres ([illegible] out-patients and one for casualty department) the[illegible]h is a separate department), are all of them [illegible] on modern lines. In addition to clinical teac[illegible]iven in the wards and out-patient department b[illegible] the [illegible]onorary staff, medical and surgical tutorial clas[illegible], a[illegible] held for senior and junior students. Clinical [illegible] in all the special departments, which includ[illegible] [illegible] for radium, electrotherapy, electrocardiogra[illegible] investigation, and venereal diseases. Post-gr[illegible] classes are held in every branch of medicine a[illegible] [illegible]gery. The Jaffray Branch Hospital contains 6[illegible]

UNIVERSITY OF LIVERPOOL

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (*M.B.* and *Ch.B.*), Doctor of Medicine (*M.D.*), Doctor in Philosophy (*Ph.D.*), Master of Surgery (*Ch.M.*), and Master of Orthopædic Surgery (*M.Ch.Orth.*). There is a diploma in *Medical Radiology and Electrology*.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 22 years on the day of graduation. At least three of the six years of medical study must have been passed in the University, at least two of which must have been passed in the University subsequent to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The subjects of the First Examination are: (1) Chemistry; (2) Biology (Zoology and Botany); (3) Physics. The subjects of the Second Examination are: (1) Anatomy; (2) Physiology (including Biochemistry and Histology). The subjects for the Final Examination are: (I) (*a*) Pathology, (*b*) Pharmacology and General Therapeutics; (II) (*a*) Forensic Medicine and Toxicology, (*b*) Public Health; (III) (*a*) Obstetrics and Gynæcology, (*b*) Surgery, Systematic, Clinical, Operative, and Practical, including Ophthalmology, (*c*) Medicine, Systematic and Clinical, including Therapeutics, Mental Diseases, and Diseases of Children. Candidates may take Parts (I), (II), and (III) separately, provided that they do not present themselves for Part (III) until they have completed the sixth year of medical study and have passed the examination in Parts (I and II).

Degrees of Doctor of Medicine and Master of Surgery. No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has received the Degrees of Bachelor of Medicine and Bachelor of Surgery (Liverpool), and at least two years have elapsed since he passed the examinations for those degrees. A candidate may also take the degree of Doctor of Medicine by examination after five years from taking Liverpool M.B., Ch.B. in (*a*) Medicine, together with (*b*) a selected branch of Medicine. A candidate for the degree of Doctor of Medicine, who elects to present a thesis, is required (*a*) to present a thesis, acceptable to the Faculty, and certified to be the candidate's own work, together with (if the candidate desires) copies of published original papers upon Medical Science; (*b*) to present himself for an oral examination on the subject of the thesis.

The subjects of examination for the Degree of Master of Surgery are: Surgery, Clinical Surgery, Operative Surgery, Surgical Pathology and Bacteriology, and Surgical Anatomy.

Degree of Master of Orthopædic Surgery.—May be conferred on graduates in Medicine of Liverpool or other approved University and graduates of a Faculty other than Medicine of Liverpool or other approved University who are Fellows of the Royal College of Surgeons of England, Edinburgh, or Ireland, or of the American College of Physicians.

The University also awards Diplomas in Medical Radiology and Electrology, Public Health, Tropical Medicine, and Tropical Hygiene.

Scholarships, Fellowships, and Prizes.—The following are awarded: (*a*) Robert Gee Entrance Scholarship (Men), annually, of £42 10*s.*, tenable for four years; (*b*) Junior Lyon Jones Scholarship, of £10 *per annum*, tenable for two years, on results of First M.B. Examination; (*c*) Senior Lyon Jones Scholarship, of £19, Competitive Examination on results of Professional Examination in Anatomy and Physiology; (*d*) Derby Exhibition of £15, Competitive Examination in Clinical Surgery; and (*e*) Clinical School Exhibition of £15 in Clinical Medicine; (*f*) University Scholarship of £50 for one year, awarded on results of the Final (Part I.) Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £150 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Biochemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £150, for one year; (*m*) Ethel Boyce Fellowship in Gynæcology, of £100, for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October in the year of the award; (*o*) Rankin Exhibition in Practical Anatomy, of £23, for one year; (*p*) Lady Jones Research Fellowship in Orthopædic Surgery, £200; (*q*) Samuels Memorial Scholarships, three at £27; (*r*) Ridgway Research Scholarship (£94); (*s*) T. J. Hughes Research Scholarship (£72); numerous prizes and medals.

The Medical School.—All the laboratories and classrooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Medicine; and the Thompson-Yates Laboratories for Physiology and Pathology. There is also a separate building for Tropical Medicine and Public Health. Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation.

Clinical Studies.—The Clinical School of the University consists of four general hospitals—the Liverpool Royal Infirmary, the David Lewis Northern Hospital, the Liverpool Royal Southern Hospital, and the Liverpool Stanley Hospital; and of five special hospitals—the Eye, Ear, and Throat Infirmary, the Women's Hospital, Liverpool, Liverpool Maternity Hospital, the Royal Liverpool Children's Hospital, and St. Paul's Eye Hospital. These hospitals contain in all a total of about 1500 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with an extensive field for clinical education and study. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

UNIVERSITY OF MANCHESTER

Four degrees in Medicine and Surgery are conferred by the Victoria University of Manchester—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine, a Diploma in Public Health, a Diploma in Bacteriology, and a Diploma in Pathology are awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degrees of M.B. and Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation, and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University subsequently to the date of passing the first M.B. Examination.

The First Examination: (1) Chemistry and Physics; (2) (*a*) Botany, (*b*) Zoology. Candidates must have attended the prescribed courses both of lectures and of laboratory work in each of the above-named subjects. The Examination is divided into two parts: Part 1, Inorganic and Elementary Organic Chemistry and Physics; Part 2, (*a*) Botany, (*b*) Zoology. The candidates sit for these parts separately. The Second Examination: (1) Anatomy and Histology; (2) Physiology, including Physiological Chemistry. Both parts must be passed simultaneously. The Third Examination: (1) Pharmacology and Materia Medica; (2) Pathology and Bacteriology. The Final Examination: (1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynæcology (including Clinical and Practical); (4) Forensic Medicine; (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts: Part I., Forensic Medicine, Hygiene and Preventive Medicine; Part II., Medicine, Surgery, Obstetrics and Gynæcology (Systematic, Clinical, and Oral). The two parts of the Final Examination must each be passed as a whole. Candidates for the Second Part must have completed the sixth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously obtained the degrees of Bachelor of Medicine and Bachelor of Surgery of this University, and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The dissertation must embody the results of personal observation, or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously obtained the degrees of Bachelor of Medicine and Bachelor of Surgery of this University, and at least one year had elapsed since they passed the examination for those degrees. The degree is conferred in the following branches: Surgery (Branch I.), Gynæcology (Branch II.), Ophthalmology (Branch III.), Laryngology, Otology, and Rhinology (Branch IV.).

Degrees of B.Sc. and M.Sc.—The ordinary degree of B.Sc. in the Schools of Anatomy and Physiology may be obtained by students in Medicine who in their third year of study for the degree of M.B., Ch.B., complete the additional courses in these subjects prescribed for this degree. Candidates for the Honours degree of B.Sc. in Anatomy or Physiology, who are students in Medicine, are required to attend courses in advanced Anatomy and Physiology for four terms after passing the Second Examination for the degrees of M.B., Ch.B. Graduates in science may proceed to the degree of M.Sc. by presentation of an approved thesis.

Diplomas: 1. The following are available for candidates holding a registrable qualification in medicine, surgery, and midwifery; examinations are in two parts in each diploma and are written, oral, and practical. Candidates may present themselves for Parts I. and II. separately or at the same time provided that no candidate be admitted to Part II. unless he has already passed in Part I. No candidate's name will be published until he has satisfied the examiners in both parts of the examination.

(*a*) *Diploma in Psychological Medicine.*—Part time course: extending over three University terms, two of which must be spent at the University. Six months' residence must be spent at a recognised Hospital for Mental Diseases.

(*b*) *Diploma in Public Health.*—The course extends over twelve calendar months at least: Part I. of the examination is held in June and October, and Part II. in March and October. Instruction for at least one of the parts must be taken out at the University.

2. *In Veterinary State Medicine.*—Length of course, three University terms. Candidates must be members of the Royal College of Veterinary Surgeons.

3. *In Bacteriology.*—For candidates who have graduated either in science or medicine, or obtained other approved qualification. Length of course, one academic year. A satisfactory thesis on an approved subject must be presented.

4. *In Pathology.*—For candidates who have obtained a registrable medical qualification or other qualification approved by the Senate. Length of course, one academic year. A satisfactory thesis on an approved subject must be presented.

Scholarships, Fellowships, and Prizes.—The following are offered in connexion with medical study at the Victoria University:—Scholarships: Dreschfeld Entrance (triennial), £20; John Russell Medical Entrance, £45; Sam Gamble Entrance for Women; Graduate Entrance (fees up to 160 guineas); two Dauntesey Medical Junior, £50 each; Dauntesey Medical Senior, £50; Professor Tom Jones Exhibition in Anatomy, £25; Dickenson Trust Scholarships in Anatomy and Pathology; Platt Physiological, £90; Dickenson Graduate Research Scholarship, £70; Dickenson Trust Travelling Scholarships in Medicine and Surgery; Ashby Memorial in Diseases of Children (triennial), £100; Holt Post-Graduate Medical Scholarship for Women, £60; Elected Research Studentships. Fellowships: Leech Research, £70; Professor Tom Jones, Surgical, £105; Morrison Watson in Anatomy, £150; John Henry Agnew in Diseases of Children, £120; Delépine in Preventive Medicine (biennial), £300; Pilkington Fellowship in Cancer Research, £300; Knight Fellowship in Psychological Medicine; Honorary Research Fellowships. Prizes: Sidney Renshaw in Physiology—Junior £10, Senior £20; Wild Prize in Pharmacology, £10; Turner Medical, two prizes each of 10 guineas; Dumville Surgical, £15; John Henry Agnew in Diseases of Children, £30. There are many general entrance scholarships, in addition to those already mentioned, open for competition, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and general and departmental libraries. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories (now removed to special buildings close to the Royal Infirmary) ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped as part of a new department for investigation in cancer. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica; new Pharmacological Laboratories were recently added. In the public health department, which is lodged in a separate institute in York-place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the medical school of the University and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, mental hospitals, a convalescent home, and other special hospitals.

A residential Hostel for final year students has been opened in proximity to the University and the Royal Infirmary, where accommodation is available also for a few graduates.

The Manchester Royal Infirmary, near the University, has accommodation for 640 beds (including 54 beds at the Central Branch). Associated with the Infirmary are: (1) the Convalescent Hospital at Cheadle, containing 136 beds; and (2) the Central Branch in the City, which has accommodation for 54 patients. The Associated Hospitals thus contain 776 beds and are under the same management. The medical side consists of four units, each unit having a testing-room for the scientific investigation of morbid products and a class-room. The surgical beds are arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing, and apparatus rooms, and its own class-room attached. One of the surgical units is assigned to orthopædic and neurosurgical cases. The gynæcological, aural, and out-patient departments each have their own operating theatre. Bacteriological investigations are carried out in a special clinical laboratory. A department for the study of heart disease, with an electric cardiograph and other instruments for research, diagnosis, and teaching purposes is attached to the medical wards. There is also a laboratory for clinical research. The X ray department has nine separate X ray outfits for different purposes, and one large room is put aside specially for X ray demonstrations and teaching purposes. A large massage school is also connected with this department. Women students are admitted on the same terms as men. Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. All the usual appointments may be held by those who have attended the practice of the Infirmary.

The Royal Manchester Children's Hospital at Pendlebury contains 190 beds and 30 in the Convalescent Home, Lytham St. Anne's. Clinical instruction is given by the medical staff at the Hospital and Dispensary, Gartside-street, Manchester. There is a massage and electrotherapeutic department, also an artificial sunlight department. Clinical assistants are appointed for periods of six months. There is an orthopædic department, out-patients for which are seen at Gartside-street, and a ward at Pendlebury is devoted to those cases needing operative treatment.

Ancoats Hospital, Manchester, is a general hospital of 150 beds and a Convalescent branch which is situated at Great Warford, Alderley Edge, Cheshire, and has 35 beds.

The medical side consists of three units under the care of three honorary physicians with three out-patient clinics of consultative nature. A cardiographic department is under the care of one of the physicians. Much work is done in gastro-enterology, neurology, and diseases of the blood. The surgical units are four in number, each under the care of an honorary surgeon; the orthopædic department, which deals with all fractures and bone injuries, is very large. One surgical unit is devoted to abdominal surgery, and one is devoted to oto-rhino-laryngology, while a urological department is under the care of one of the honorary surgeons. All these units have a largely attended out-patient department. Clinical teaching is given both to under-graduate and post-graduate Students in all the out-patient clinics which are free to them, and in the wards, while special courses of post-graduate lectures are given as part of the Manchester University post-graduate scheme. Clinical assistantships are available for post-graduates.

There are six resident appointments which are open to men and women graduates. There are also four registrar appointments, part-time: medical, surgical, orthopædic, and laryngological made annually.

UNIVERSITY OF LEEDS

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.). also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine. Courses and Degrees in the Faculty are open to men and women alike.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination. The First Examination consists of: Part I., Physics and Inorganic Chemistry; Part II., Organic and Physical Chemistry; Part III., Botany; Part IV., Zoology. Candidates will be allowed to pass the parts separately. The Second Examination consists of: Part I., Materia Medica and Practical Pharmacy; Part II., Anatomy and Physiology. Candidates will be allowed to pass either part separately. The Final Examination consists of: Part I., Pharmacology, Pathology, and Bacteriology; Part II., Medicine, Surgery, Obstetrics and Gynæcology; Part III., Forensic Medicine, Public Health, and Therapeutics. Part I. may be taken at the end of the second clinical year, and Parts II. and III. may be taken at the end of the third clinical year, but not before the completion of the fifth year of medical study. If taken separately Part III. may not be passed before Part II.

Degree of Doctor of Medicine and Master of Surgery. Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least two years' Hospital Practice or four years' other professional practice for the former and one year has elapsed for the latter since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine may present a dissertation and, if the dissertation is considered to be of exceptional merit, will not be required to pass an examination. The first term commences on Oct. 1st. Prospectus can be obtained from the Academic Sub-Dean.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods, or post-graduate classes held by members of the clinical staff, may do so on application to the Clinical Sub-Dean, from whom particulars may be obtained.

The Scholarships and Prizes, in order of importance, are: (1) medical scholarship, value £130; (2) Infirmary scholarship, value £75; (3) the Littlewood prize, value about £50; (4) West Riding Panel Practitioners' prize, value £25; and (5) the William Hey gold medal. The last is generally awarded to a young graduate who figures in the other prizes and sentimentally may be considered of first importance.

Clinical Studies.—The clinical studies are pursued mainly at the **LEEDS GENERAL INFIRMARY AND WOMEN'S HOSPITAL**, which has accommodation for 694 in-patients, including 88 beds at branch hospitals in the country. Clinical teaching takes place daily in the wards, in medicine and surgery. There are medical, surgical, ophthalmic, aural, electrotherapeutic, and radiographic departments, in each of which special instruction is imparted to students. Gynæcological and children's departments, together with laryngeal, venereal, and skin clinics, are in operation, and there is a special ward for cases of nutritional disorders of children.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Mental Hospital and Leeds City Fever Hospital respectively.

The General Infirmary.—This hospital has accommodation for 655 beds which are allotted, 477 to general medical and surgical cases, adults and children, the remainder being given up to ophthalmic, aural, orthopædic, radium, and dermatological cases. In that total is included the patients in the semi-convalescent branch hospitals, the Ida and Robert Arthington, containing 100 beds. The University and hospital paid appointments in connexion with the Infirmary and other bodies are numerous. Associated also with the Infirmary is the Women's Hospital of 84 beds for the treatment of gynæcological and obstetric diseases; students when eligible attend the practice of this hospital, to which there are two paid resident appointments.

Leeds Maternity Hospital contains 135 beds for cases of labour, while there is other accommodation attached for the treatment of morbid pregnancies. There is an X ray department, and large extern districts are centred upon the institution. The hospital is affiliated to the University for purposes of clinical training, and every student takes an obstetric clerkship and attends in the intern and extern departments. During the second and third months personal contact with not less than 20 cases of labour is required, the students being resident in the neighbouring hostel.

West Riding Mental Hospital.—The well-known hospital at Wakefield accommodates 2600 patients, a separate building, containing 360 beds, being provided for the treatment of acute insanity, while mentally deficient children are accommodated in separate homes in juxtaposition. Clinical clerkships in the wards and laboratories can be filled by qualified practitioners or, on application to the medical superintendent, by senior students. This hospital is a recognised institution for the purpose of training for the Diploma in Psychological Medicine. Courses of Lectures in Mental Diseases and laboratory work can be taken at the hospital, forming part of the University of Leeds Course for the Diploma.

UNIVERSITY OF SHEFFIELD

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation, and have pursued the courses of study required by the University regulations during a period of not less than five and a half years subsequently to the date of his matriculation, three of such years at least having been passed in the Faculty of Medicine of the University one at least being subsequent to the passing of the Second Examination. The subjects of the First Examination are Chemistry, Physics, and Biology. Candidates must, in addition to matriculation, pass a preliminary examination in Physics and Chemistry before taking the First Examination. Students who before entry have attained a standard in Chemistry and Physics approved by the Faculty of Medicine have the opportunity of working for the degree of B.Sc. (with honours) in Physiology concurrently with their work for the degree of M.B., Ch.B. The Second Examination: Candidates must have attended courses of instruction in Physiology (first part) for one year, and in Anatomy for five terms. The Third Examination: Candidates must have attended courses of instruction in Pathology for five terms, in Pharmacology for four terms (and one term in Pharmacy), in Applied Anatomy for four terms, and in Physiology (second part) for six terms. The Final Examination: The subjects are, Part I., Forensic Medicine and Public Health. Candidates must have attended courses *for one term in each subject*; *Part II.*, Medicine (including Mental Diseases, Diseases of Children, and Vaccination), Special Pathology (including Morbid Anatomy and Clinical Pathology), and Therapeutics; Part III., *Surgery (including the* administration of Anæsthetics, Diseases of the Ear, Nose, and Throat, Ophthalmology, and Surgical Pathology), and Obstetrics and Gynæcology, including Antenatal and Postnatal practice and Infant Hygiene. Candidates for Parts II. and III. must have completed a minimum of five and a half years of approved study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least three years previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B., Ch.B. at least three years previously, and must since have held for not less than twelve months a surgical appointment in a public hospital.

The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy, Surgical Pathology and Bacteriology.

Scholarships and Prizes.—The following scholarships are offered: Four Town Trustees scholarships offered annually, each of the value of £50 per annum for three years. Medical: offered annually, covers cost of tuition for a degree course in the Faculty of Medicine. Six Edgar Allen, offered annually, each of the value of £100 per annum for three years. Post-graduate: Frederick Clifford scholarship, value £50 per annum, tenable for two years. Mechanics' Institute scholarship, value £50 for one year with free admission to those University courses taken by the holder in connexion with his work, renewable for a second year. Town Trustees fellowship, value £75 for one year. Medals and Prizes: Kaye scholarship; Thomas Woodcock Prize; Gold Medal in Clinical Medicine and Surgery; John Hall Gold Medal in Pathology; Holroyd Gold Medal in Anæsthetics; the Walter S. Kay Gold Medal in Mental Diseases; bronze medals. Particulars of all the above may be obtained from the Registrar.

The Medical School.—The Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of the Union Representative Council, elected annually. There are large and comfortable common rooms both for men and women students, and two Students' Unions, one for men and one for women. A refectory is open daily at the University where students may obtain meals and refreshments at moderate prices. The University journal *The Arrows* and a Medical School journal the *North Wing*, edited by a committee of staff and students, are published each term. A well-equipped Union building is in course of erection. There is good hostel accommodation for women students and similar amenities will soon be provided for men.

Clinical Studies.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes, and, as will be seen, the aggregate number of beds is very large.

The Sheffield Royal Infirmary (500 beds) and the Sheffield Royal Hospital (340 beds) provide all the opportunities associated with a large general hospital with the usual out-patient and in-patient departments for diseases of ear, throat, and nose, eye, skin, and venereal diseases; there are also orthopædic and psychiatry clinics. The two institutions are amalgamated for the purposes of clinical practice, medical, surgical, and special, and house appointments are available. The Jessop Hospital for Diseases of Women, with 143 beds, has also a maternity department, with about 110 in-patients per annum and about 3000 out-patient cases attended; in addition there are facilities for obstetrical work at the Municipal Hospital. The Children's Hospital has 118 beds. Special courses on acute Infectious Diseases are held at the City Fever Hospital (740 beds) and on Tuberculosis at the Municipal Sanatoria and Clinics (510 beds). The South Yorkshire Mental Hospital (2000 beds) is available for teaching in Mental Diseases. Every facility is afforded in the various laboratories for the prosecution of advanced study and research.

Post-graduate courses of clinical instruction are held annually in the various hospitals connected with the school.

UNIVERSITY OF BRISTOL

In the Faculty of Medicine there are the following degrees: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There are also the following diplomas: Diploma in Public Health (D.P.H.),* *Diploma in Dental Surgery* (L.D.S.), and Diploma in Veterinary State Medicine.*

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass, at *Matriculation standard*, an examination called the *School Certificate* Examination, or to pass such examination as may be regarded as equivalent by the Senate. *All courses*, degrees, and diplomas are open to men and women.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics and entering on the professional curriculum at the University, or an institution recognised as equivalent, of which three shall have been passed in the University, and two of these three subsequent to passing the second examination. All candidates for the degrees of M.B., Ch.B. are required to satisfy the examiners *in the several subjects of three examinations.* The First Examination: The subjects of examination are: Chemistry (Inorganic), Physics, and Biology. This part of the curriculum *shall extend* over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.) The Second Examination: The subjects of examination are: Organic Chemistry (Section I.) and Anatomy and Physiology (Section II.). The *Final Examination*: The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Pharmacotherapeutics, General Pathology and Bacteriology (Section I.); Special Pathology, Forensic Medicine and Toxicology, Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative, including Ophthalmology and *Oto-rhino-laryngology*), Medicine (Systematic, Cinical, and Practical, including Mental Diseases) (Section II.). The subjects included in Section II. may be taken in two *groups*—viz., Group

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* At present in abeyance.

I., Surgery and Obstetrics; Group II., Medicine, Public Health, Special Pathology, Forensic Medicine and Toxicology. Candidates may pass Sections I. and II. together, or separately, and the two groups of Section II. may be taken together or separately. but no student can obtain honours who elects to take the two groups of Section II. separately.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a Diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—The degree may be taken in General Surgery or in Special Subjects. Candidates shall be Bachelors of the University who have practised for two years in an approved hospital (including the holding of an approved appointment for six months) and one of the two years shall have been spent in a hospital with a medical school attached. They shall present a Dissertation and pass an examination. For General Surgery, the examination shall include a written examination in Surgery, a written examination in Surgical Anatomy and Surgical Pathology, a Clinical examination, an oral examination and an examination in Operative Surgery. For special subjects—that is, Ophthalmology or Oto-rhino-laryngology or Gynæcology—the examination shall include a written examination in the Anatomy, Physiology, and Pathology of the region of the body concerned (including in the case of Ophthalmology, Physiological Optics) and a written examination in General Surgery together with a written. oral, and clinical examination in the particular branch of Surgery concerned, as well as an examination in Operative Surgery of the region concerned.

Scholarships and Prizes.—The following are awarded: The Ashworth Hallett Scholarship, value £40. open to women only; two Martyn Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value £7 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth or sixth year students for general proficiency; the Augustin Prichard Prize, value about 6 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in obstetrics and gynæcology; the Crosby Leonard Prize, value 6 guineas, for proficiency in surgery; the Suple Surgical Prize, a gold medal and 7 guineas; the Suple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12 for dressers; the H.M. Clarke Scholarship, value £15. for proficiency in surgery; The Royal Infirmary Faculty Prize, value £20, for general proficiency; the Sanders Scholarship, value £22 10*s*., for general proficiency; the Barrett-Roué Scholarship for proficiency in diseases of the eye, ear, nose, and throat or skin, value £17; Lady Haberfield Scholarship, value about 25 guineas; the Paul Bush Gold Medal in alternate years to best Resident Medical Officer at Royal Infirmary; Markham Skerritt Memorial Prize, awarded every three years to that member of University, not a member of Medical Board, who, in opinion of that Board, has published the best original work during the three years.

Bristol City Senior Scholarships and those offered by the Counties of Gloucestershire, Somerset, Wilts, and Dorset and the City of Bath are tenable in the University. There are also a Miriam Badock Scholarship of the value of £120, H. H. Wills Science Scholarships, open to boys proceeding from Clifton College; and the Harold Greenwood Memorial Scholarship, of the value of £20, open to boys who have received instruction at State-provided schools in Clevedon (or elsewhere in Somerset) and subsequently at secondary schools in Somerset or Bristol. The Beaverbrook Fellowship and some of the Fellowships awarded by the Colston Research Society for research in the University are allotted to the Faculty of Medicine. University Graduate Scholarships are open to graduates of not more than one year's standing. The Michael Hiatt Baker Scholarship of the value of £200 is open to graduates from New Zealand for research in the University.

Clinical Studies.—The Allied hospitals (BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL) have between them more than 700 beds and extensive out-patient departments, special clinics for Diseases of Women and Children, including antenatal and postnatal work, also for eye, ear, nose, and throat, and skin diseases, heart diseases, rheumatism, asthma, and cancer. Here are in addition large and well-equipped departments for Dental work and large outdoor Maternity Departments. The venereal diseases clinic for Bristol is at the Royal Infirmary. The Bristol Royal Infirmary has been selected by the National Radium Commission as a Radium Centre.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for morbid anatomy. There are also laboratories for work in clinical pathology, bacteriology, and biochemistry, in which special instruction is given in these subjects. Departments are provided and well-equipped for radiology, radiotherapy, actinotherapy, electrotherapy, and massage, with all forms of physiotherapy.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 120 beds, and that of the Bristol Eye Hospital with 40 beds, the Bristol Mental Hospital, Southmead Hospital, and Ham Green Fever Hospital. Other institutions, including Stoke Park Colony for mental defectives and the Winford Orthopædic Hospital, are also available for their special purposes.

There are numerous salaried junior appointments for residents who are graduates.

Post-graduate Study.—Qualified medical practitioners may be appointed as clinical assistants for a period of one or more months. They may act as assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Demonstration courses are held at various times when applied for by groups of practitioners.

All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Department of Medicine, University of Bristol, who can be seen on any day by appointment.

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES

THE WELSH NATIONAL SCHOOL OF MEDICINE

The University grants degrees in Medicine and Surgery—Bachelor in Medicine and Bachelor in Surgery (M.B., B.Ch.). Doctor in Medicine (M.D.), and Master in Surgery (M.Ch.)—and Diplomas in Public Health (D.P.H.) and Tuberculous Diseases (T.D.D.).

Degrees of Bachelor in Medicine and Bachelor in Surgery.—Candidates are required to pursue a course of study of not less than six academic years subsequent to their matriculation in the University, and of these years at least three must have been passed in one of the four constituent colleges situated at Aberystwyth, Bangor, Cardiff, and Swansea. They must hold an arts or science degree of the University of Wales, or of some other University approved for the purpose, but certain of the courses pursued for a B.Sc. or a B.A. degree may be counted as required for the Medical degrees.

The courses for the M.B., B.Ch. are divided into two sections. The first includes the preliminary subjects: (a) Physics, Chemistry, Botany, and Zoology; and (b) Organic Chemistry, Human Anatomy, and Physiology. Study of the preliminary subjects and of Organic Chemistry must extend over at least one academic year; study of Physiology and Human Anatomy must extend over at least two academic years; the first section of the course must occupy not less than three years. The second section includes courses in Materia Medica and Pharmacology, Pathology and Bacteriology, Hygiene and Forensic Medicine, Medicine, Surgery, and Obstetrics and Gynæcology. These courses cannot be commenced until the examinations relating to the preliminary and ancillary courses have been passed. Examinations in all the subjects are held twice each year.

Degree of Doctor of Medicine.—Every candidate for the degree of Doctor in Medicine shall satisfy the examiners in an examination in Clinical Medicine and shall submit a thesis to the judgment of the University. A candidate may present himself for the examination in clinical medicine during or subsequently to the second year after qualification for the degrees of Baccalaureus in Medicina and Baccalaureus in Chirurgia, and may submit his thesis during or subsequently to the third year after qualification for those degrees. The thesis shall embody the results of the candidate's personal observation or original research in some branch of medical knowledge or of some science directly relative to medicine, excepting a subject that is exclusively surgical. The candidate shall indicate in what respects his thesis appears to him to advance medical knowledge or practice. A candidate shall be required to submit himself to an oral or other examination on the subject matter of the thesis; provided always that in exceptional circumstances it shall be within the discretion of the University to exempt a candidate from such an examination.

Degree of Master of Surgery.—Every candidate for the degree of Magister in Chirurgia shall satisfy the examiners in an examination in Surgery and shall submit a thesis to the judgment of the University. A candidate may present himself for the examination in Surgery during or subsequently to the second year after qualification for the degrees of Baccalaureus in Medicina and Baccalaureus in Chirurgia, and may submit his thesis during or subsequently to the third year after qualification for those degrees. The examination in Surgery shall consist of two parts: Part I.—(i) Surgical Anatomy, (ii) Bacteriology and Surgical Pathology; Part II.—(i) Surgery, (ii) Clinical Surgery, (iii) Operative Surgery. No candidate shall be deemed to have passed in Part II. unless he has atisfied the examiners in Part I. of the examination. The thesis shall embody the results of the candidate's personal observation or original research in some branch of surgical knowledge or of some science directly relative to surgery. The candidate shall indicate in what respects his thesis appears to him to advance surgical knowledge or practice. A candidate shall be required to submit himself to an oral or other examination on the subject matter of his thesis; provided always that in exceptional circumstances it shall be within the discretion of the University to exempt a candidate from such examination.

Post-graduate Study.—Certain courses of Post-graduate study are given during the year, and facilities may be offered to graduates in medicine and other duly qualified persons to carry out research work in the different departments of the Medical School. Research scholarships are available ranging in value from £150 to £250 per annum. Further information regarding these is given later under the heading "Research Scholarships."

Clinical Institutions.—Clinical teaching is carried out in the Cardiff Royal Infirmary (490 beds); the Llandough Hospital (City of Cardiff) (340 beds); the City Lodge Hospital (City of Cardiff) (420 beds); the Cardiff City Mental Hospital (790 beds); the Cardiff City Isolation Hospital (270 beds); the Prince of Wales' Hospital (Orthopædic) (132 beds); the Cefn Mably and Glan Ely Hospitals (Tuberculosis) (298 beds). These Institutions are modern and well-equipped, and provide facilities for both In-patient and Out-patient Clinical Instruction. The Cardiff Royal Infirmary is the main teaching hospital. It serves a district having a population of more than half a million, and during the year 1934 6616 patients were admitted to the wards, and 39,681 patients treated in the Out-patient Departments.

Scholarships, Free Studentships, Prizes, and Medals. Entrance Scholarships, County Free Studentships and Scholarships are available. Particulars of these are contained in a special Prospectus, which can be obtained on application. An Isaac Roberts Scholarship in Science, of the value of £50 per annum, tenable for three years, is awarded triennially on the results of the Entrance Scholarship Examination of the Cardiff College. The Samuel Brothers' Scholarship, value £12 to £15, is awarded annually on the results of the work of the first year of the Medical Course at Cardiff College. The Dr. Price Prize, value £50, is awarded annually on the results of the work of the first year of the Medical Course at the Cardiff College. The Dr. Howell Rees Scholarship, value £17 10s., is awarded triennially, and is held in The Welsh National School of Medicine; it is awarded on the result of the examinations in Anatomy and Physiology. Numerous other prizes are awarded for proficiency in different subjects.

Research Scholarships.—A Catherine Buckton Scholarship of £60 for one year is offered periodically by the Council of Aberdare Hall (one of the Halls of Residence for Women Students) to a woman who shall undertake to do Post-graduate work. The Mrs. John Nixon Research Scholarship of £150 per annum is available for the promotion of research in Medicine and Medical Pathology. The Lord Merthyr Research Scholarship, value £200 per annum, is available for the promotion of research in Cancer. A Cecil Prosser Research Scholarship, value £250 per annum, is available for the promotion of research in Tuberculosis. The Ewen Maclean Research Scholarship, value £150 per annum, is available for the promotion of research into the factors which constitute and the conditions which vary resistance to disease, especially as regards midwifery.

Regulations regarding the diplomas in Public Health and Tuberculosis are detailed elsewhere.

All inquiries should be addressed to the Secretary, Welsh National School of Medicine, The Parade, Cardiff.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS

CONJOINT EXAMINING BOARD

All the schools described under the heading of the Universities to which they are attached are recognised as suitable places of instruction by the corporations granting medical diplomas. On p. 480 will be found the Metropolitan Hospitals, where general and special studies can be pursued. On p. 494 the centres outside London affording educational facilities are described. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

Students of the Royal Colleges pass a Preliminary Examination in General Education recognised by the Board, and a *Pre-Medical Examination* in Chemistry, Physics, and Elementary Biology conducted by the Conjoint Examining Board before commencing the *five years curriculum of professional study or some* other examination recognised by the Board—namely the examination in Chemistry, Physics, and Biology for the degree in Medicine of any University recognised by the Board; the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board; the Higher Certificates of London, Bristol, Durham Universities, the Joint Matriculation Board of the Northern Universities, and the Central Welsh Board Higher Certificate. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. No study of anatomy and physiology is recognised before this examination is passed. Not more than two terms of professional study (Anatomy and Physiology) will be recognised before Elementary Biology is passed. He will be admitted to the examination on producing evidence of having passed the required preliminary Examination in General Education. The examination is partly written, partly oral, and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of a period of not less than three months.

There are two Professional examinations called the *First* and *Final Examinations*. The courses of study for these examinations may be commenced before the Pre-Medical examination in Biology or some equivalent examination has been passed, provided that three terms of study are completed after the examination has been passed.

The subjects of the First Professional Examination are: Section I. (*a*) Anatomy, including Histology and Embryology; (*b*) Physiology, including Biochemistry. Section II. Pharmacology and Materia Medica. A candidate must have attended at a recognised Medical School courses of instruction in Anatomy, including Embryology, during five terms, during which he must have dissected the whole body, courses of instruction in Physiology, including Biochemistry during five terms, courses of instruction in Pharmacology and Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (*a*) and (*b*) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the Final Professional Examination, provided that the courses for Section I. have been completed. A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subjects.

Final Professional Examination.—The subjects of the Final Professional Examination are: Section I. Pathology (including Morbid Anatomy, Morbid Histology, and Clinical Pathology) and Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine, and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynæcology. The examination is partly written, partly practical, partly clinical, and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the Final Examination separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. Members of recognised universities outside the British Possessions are admissible to the examinations of the diplomas of L.R.C.P. and M.R.C.S. under special conditions. Graduates in medicine and surgery are required to pass the first examination and to complete 36 months hospital practice before admission to any part of the final examination. Undergraduates are required to complete the full curriculum, after passing the Pre-Medical Examination. For further information see the current regulations of the Conjoint Examination Board in England.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First Examination may present themselves for the Final Examination under special conditions. The Royal Colleges also grant Diplomas (see p. 529 in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, in Tropical Medicine and Hygiene, in Laryngology and Otology, in Medical Radiology, in Anæsthetics, and in Child Health. The Diploma in Gynæcology and Obstetrics is being discontinued after the October examination has been held. For all these diplomas candidates must hold a medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, Colonial, or Foreign University.

Particulars may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, London, W.C.1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

THE MEMBERSHIP AND FELLOWSHIP

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—The age for admission to this diploma, it will be noticed, has been changed from 25 to 23 years. The alteration in the by-law of the College is designed to enable men who have just finished house appointments to sit for an examination for which their recent clinical experience has exactly fitted them. The candidate must either have obtained the licence of the College, or a degree of Doctor or Bachelor of Medicine at a University which is registrable by the General Medical Council and is recognised by the Censors Board. The examination is directed partly to pathology and partly to the practice of medicine. Credit is also given to candidates who show a knowledge of Latin, Greek, French, or German. Further information may be obtained from the Registrar at the College.

Fellowship.—Fellows are selected annually from the ranks of Members by the Council of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

THE FELLOWSHIP

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the Primary Examination and the Final Examination. The subjects of the Primary Examination are Anatomy and Physiology and those of the Final Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly viva voce, and include the examination of patients and the performance of operations on the dead body. The Primary Examination is held in May and November and the Final Examination in May and November.

Conditions of Admission to the Primary Examination.—A member of the College is admissible to the Primary Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First Professional Examinations of the English Conjoint Board in Anatomy and Physiology, or the equivalent examination in his University, on the production of certificates of attendance upon prescribed courses.

Conditions of admission to the Final Examination.

(A) *For members of the College or Graduates in Medicine who passed the Primary Examination before Jan. 1st,* 1935.—(1) A Member of the College is admissible to the Final Examination at any time after having passed the Primary Examination, on producing satisfactory evidence of having been engaged for not less than six years in the study (or study and practice) of the profession. (2) A candidate who is not a Member of the College, but who possesses a qualification recognised by the Council for the purpose, is admissible to the Final Examination, after having passed the Primary Examination, on the production of evidence of having been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance upon the surgical practice of a recognised Hospital or Infirmary.

(B) *For all other candidates.*—A candidate who has passed the Primary Examination and who is *either* (*a*) a Member of the College who can produce satisfactory evidence of having been engaged in the study (or study and practice) of the profession for not less than six years, *or* (*b*) a Graduate of four years' standing in Medicine and Surgery in a University recognised by the Council for the purpose, is admissible to the Final Examination on producing evidence that he has held for not less than six consecutive months the post of Resident House Surgeon, or other responsible post in charge of general surgical patients in the wards of a general hospital recognised by the Council for the purpose.

Note.—In compliance with a condition of the Charter the Diploma of Fellow is not conferred upon successful Candidates until they have attained the age of twenty-five years.

BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS

The College was incorporated in September, 1929, "to encourage the study and practice of Obstetrics and Gynæcology, subjects which should be inseparably interwoven." It consists of Fellows and Members, and includes practically every teacher of obstetrics and gynæcology in Great Britain and the British Dominions.

Candidates for the Membership must be entered on the British Medical Register or be eligible for entry hereon. Before being accepted for the examination hey must produce evidence, satisfactory to the examination committee, of having held resident hospital appointments in general medicine or surgery and in obstetrics and gynæcology for the period laid down in the regulations (at present six months each). The examination consists of the presentation of case records and commentaries, together with an oral and clinical examination.

The Fellowship of the College is granted to those members who are judged by the College to have advanced the science and art of obstetrics and gynæcology. The Fellowship or Membership of the College is now a necessary qualification for election to the staff of several obstetric and gynæcological hospitals, and it is hoped that, in time, it will be essential for election to the staff of all such hospitals, consequently, all intending to specialise in obstetrics and gynæcology should endeavour to obtain the Membership as soon as possible.

For those practitioners who have had special post-graduate experience in obstetrics and wish to have some tangible proof of this, but whose experience and work does not allow of their admission to the Membership, the College has instituted a diploma, (D.C.O.G.). Candidates for it must produce evidence of post-graduate experience in general medicine or surgery and obstetrics and gynæcology. The obstetrical experience must have been obtained in a resident appointment. At the present time applications by general practitioners who have had special experience in obstetrics but have not held a resident appointment and cannot now do so are specially considered by the examination committee, although in the near future it is intended to adhere strictly to the regulations.

The regulations for the Membership and Diploma may be obtained from the Hon. Secretary, The British College of Obstetricians and Gynæcologists, 58, Queen Anne-street, London, W.1.

SOCIETY OF APOTHECARIES OF LONDON

The Pre-Medical and Primary Examinations are held quarterly. The Pre-Medical includes Chemistry, Physics, and Elementary Biology. The Primary includes Anatomy, Physiology and Histology, Materia Medica, and Pharmacy. The latter examination cannot be passed before the completion of five terms' Physiology and Practical Anatomy with Demonstrations, and the first two subjects cannot be taken separately except in the event of the candidate having previously passed in one, and obtained at least half the marks required to pass in the other.

The Final Examination for the Licence (L.M.S.S.A. Lond.) is held monthly, except in September. (A) Principles and Practice of Surgery, including Surgical Pathology, Surgical Anatomy, Operative Manipulation, Instruments and Appliances. (B) Principles and Practice of Medicine, including Therapeutics, Pharmacology, Medical and General Pathology, Bacteriology, and Morbid Histology. (C) Midwifery, Gynæcology, Diseases of New-born Children, and the Use of Obstetric Instruments. (D) Forensic Medicine, Hygiene, Mental Diseases, and the Theory and Practice of Vaccination. The examination is partly written, partly practical, partly clinical, and partly oral. Sections A, B + D, and C may be taken at separate examinations, but there is no exemption from any part of the Final Examination.

The minimum period of medical study extends over five years (57 months), and three academic years (33 months) must elapse after a candidate has passed the examination in Anatomy and Physiology before he can complete the *Final Examination.* The course of study for the Final Examination includes attendance on the Surgical and Medical Practice with Post-mortem Examinations, at a hospital connected with a medical school for a period of three winter and three summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The offices of dresser and clinical clerk must have been filled at a hospital or institution recognised by the Society.

The certificates prescribed by the Regulations must be produced before admission to the respective sections of the Final Examination.

Master of Midwifery.—The examinations for this Diploma are held in May and November. Candidates will be admitted to the examination who have been registered practitioners for at least three years and who have held a resident appointment in an institution recognised by the Society for six months or more, and who for three months in each case have attended an antenatal clinic and an infant welfare centre, also recognised by the Society. Medical officers employed by a public health authority, and having special duties connected with Maternity and Child Welfare, will be admitted to the Examination on production of evidence to that effect. The examination will be conducted by written papers and by clinical and oral tests.

Candidates for the examination must send in their certificates to the Registrar, who will supply any other information.

METROPOLITAN CENTRES AFFORDING EDUCATIONAL FACILITIES

Certain organisations and institutions provide for the needs of the medical student in his curriculum and for the post-graduate student requiring special forms of instruction and opportunities for clinical observation. Many of the institutions are recognised by the English Conjoint Examining Board as a place of study for the fifth year of the curriculum.

Special Diplomas in public health, tropical, psychological, and ophthalmic medicine, medical radiology and electrology, laryngology, otology, and tuberculosis are now granted in proof of intensive work along the different lines indicated. Of these, the Diploma in Public Health, being regulated by the General Medical Council, is registrable. Appointments to and promotion in the various Services are largely dependent on the possession of a particular diploma, and each syllabus of the special courses available at the institutions which follow, either with or without association with the Fellowship of Medicine, is planned to afford the necessary instruction.

The Special Diplomas are dealt with fully on p. 529, where the Bethlem Royal Hospital, the Maudsley Hospital, and the Diploma in Psychological Medicine are referred to. Similarly the Hospitals of the Metropolitan Asylums Board provide post-graduate as well as under-graduate facilities, while the hospitals of the Seamen's Hospital Society both supply the instruction necessary for the Diploma in Tropical Medicine and Hygiene, and coöperate in the activities of the Fellowship of Medicine and Post-Graduate Medical Association.

The Fellowship of Medicine and Post-Graduate Medical Association

Some 50 general and special London hospitals work in conjunction with this Association, which has its office at Room 28 in the House of the Royal Society of Medicine, 1, Wimpole-street, London, W. 1. Arrangements are made for courses in medicine and in surgery and the specialties, occupying the whole or part of each day for periods of one to four weeks. Daily clinical teaching arranged. Special evening clinical courses for the M.R.C.P. and F.R.C.S. (Primary and Final) Examinations are organised at intervals. Courses, demonstrations, and lectures arranged by the Fellowship of Medicine are open only to members of the Fellowship. The membership fee is £1 1*s.* per annum, which includes the subscription to the monthly *Post-Graduate Medical Journal.* The provisional list of Special Courses impending will shortly be available. Full information regarding the courses of study and fees can be obtained from the Secretary.

Infectious Hospitals of the London County Council

Classes of instruction in fevers for undergraduate medical students are given at the various hospitals, normally commencing in January, May and October each year. The minimum duration of the course is two months, and sixteen attendances are necessary before a certificate can be granted to a student that he has satisfactorily completed his course. The prescribed fee for a two months' course is £3 3*s.* The medical superintendents arrange direct with the deans of the medical schools concerned as to the days and hours of the classes. Students desiring to take this course should apply to their dean for information. In addition, classes of instruction for the Diploma of Public Health, which comply with the rules of the General Medical Council for that Diploma, are given at two of these hospitals—viz., North-Western Hospital and Brook Hospital. The minimum duration of this course is three months, and twenty-four attendances are necessary before certificates can be granted. The prescribed fee for a three months' course is £3 13*s.* 6*d.* Full particulars relating to these classes may be obtained on application to the Medical Officer of Health. London County Council, Public Health Department, Special Hospitals Division, County Hall, Westminster Bridge, S.E.1.

Seamen's Hospital Society

The Society possesses six establishments: the Dreadnought Hospital at Greenwich, 257 beds; the Albert Dock Hospital, E.16, 53 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, W.C.1, 76 beds; Tilbury Hospital, Tilbury Docks, Essex, 94 beds; King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds; and the Angas Home, Cudham, 36 beds. Courses of operative surgery and surgical pathology are arranged by the London School of Clinical Medicine at the Dreadnought Hospital. Post-graduate Courses for Ship Surgeons are organised by the Society, Part II. (Tropical Medicine and Hygiene) being held at the London School of Hygiene and Tropical Medicine, commencing April 11th, and Part III. (Refresher Course in clinical subjects) at the Dreadnought Hospital, Greenwich, commencing in October.

The clinical teaching of the London School of Hygiene and Tropical Medicine is given at the Society's Hospital for Tropical Diseases, Endsleigh-gardens, W.C.1.

GENERAL

Royal Northern Group of Hospitals

The Royal Northern Hospital, Holloway, London, N.7, is the main institution of the Royal Northern Group of Hospitals, which includes the St. David's Wing for private patients, the Royal Chest Hospital, City-road, E.C., Grovelands Hospital (Recovery Branch), Southgate, the Maternity Nursing Association, and the Reckitt Convalescent Home, Clacton-on-Sea. The total number of beds in the group is 466. Besides the honorary staff, there are six anæsthetists, two pathologists, medical and surgical registrars, resident medical officer, two resident house physicians, three resident house surgeons, two resident casualty officers, one resident obstetric surgeon, and one resident anæsthetist. The large rectangular and circular wards, each of which contains 25 beds, the maternity ward and children's ward for children up to 5 years of age, the observation wards in the new Casualty Department, the six operation theatres, and out-patient department are designed with a view to offer the greatest facilities for clinical work. The Special Departments include the following: orthopædic, genito-urinary, and neurological, physiotherapeutic, pathological, tuberculosis, venereal diseases, and X ray (recently remodelled). Patients are removed to the Recovery Branch by ambulance a few days after operation. Demonstrations are given daily in the wards and out-patient departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments, and may receive certificates at the end of their terms of office. A new maternity department has been opened and the light department has been re-equipped. A complete hospital for paying patients has just been completed.

Post-graduate lectures and demonstrations are arranged from time to time, as advertised in the medical press.

Prince of Wales's General Hospital

This hospital, situated in Tottenham, is in the midst of a densely populated neighbourhood, and contains medical, surgical, gynæcological, and children's wards, having 238 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin diseases, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction is given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are six resident medical officers, and clinical assistants are appointed under certain conditions. Special intensive post-graduate courses are also held at intervals throughout the year.

West London Hospital

This hospital has 220 beds. Attached to the hospital is the West London Post-Graduate College. The practice of the hospital is reserved for qualified men and those referred in the final examinations. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards. Clinical assistantships are obtainable in the various general and special out-patient departments. The accommodation for post-graduates consists of a lecture-room, together with reading, writing, and class-rooms. The hospital has a fully equipped pathological laboratory. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave, and by the Conjoint Board of Examiners.

National Temperance Hospital

The hospital (Hampstead-road, N.W.) contains 152 beds. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Monday, 1.30 P.M.; Tuesday, 2 P.M.; Wednesday, 2 P.M.; Thursday, 9 A.M.; Friday, 11 A.M. Out-patient departments for the following classes of case have been opened: dermatology, ophthalmology, oto-rhino-laryngology, diseases of the chest and of the rectum. There is also an out-patient gynæcological clinic.

Hampstead General and North-West London Hospital

In-patient Department: Haverstock Hill, N.W.; Out-patient Department: Bayham-street, Camden Town (138 beds—viz., 109 free, 8 isolation and observation, and 21 paying or contributory). Serves Hampstead and the populous districts of Kentish Town and Camden Town. The out-patient and casualty departments are at Bayham-street, Camden Town. Hampstead casualties are received at Haverstock Hill. In addition, consultative clinics are held at Haverstock Hill, where patients are seen upon presenting letters from their doctors. There is a post-graduate School free to the medical practitioners of the district. The hospital is also associated with the Fellowship of Medicine.

Metropolitan Hospital

This hospital has 150 beds, 17 of which are reserved for children. The adult accommodation includes special wards for the reception of Hebrew patients, and there is a Kosher kitchen and Jewish cook. Operations are held in the afternoons daily, except Wednesdays, Saturdays, and Sundays. The out-patient department is a large one, and has facilities for the treatment of all diseases; Jewish patients can attend special sessions. Special departments comprising: Neurological, Ophthalmic, Rectal Diseases, Diseases of Women, Genito-urinary, Diseases of the Throat and Ear, Eye and Skin, Electrotherapeutics, Dental, and V.D. Attached to the hospital is a Tuberculosis Dispensary for patients from the boroughs of Hackney and Stoke Newington.

Queen Mary's Hospital for the East End

This hospital has developed from the West Ham and Eastern General Hospital. It has 219 beds and ministers to a very poor public. Founded as a dispensary in 1861, and developing into a hospital in 1890, steady extensions have been made during this century. A Royal Charter was obtained in 1917, and the hospital has become a valuable charity with a full medical staff of physicians and surgeons, and specialists for gynæcology, obstetrics, ophthalmological surgery, radiology, dermatology, and dental surgery. The Fellowship of Medicine makes frequent use of the opportunities.

NEUROLOGY

National Hospital, Queen-square

The hospital, with the Convalescent Home at East Finchley and branch at Clapham Park, contains 265 beds and cots. The out-patient physicians attend every Monday, Tuesday, Wednesday, Thursday, and Friday at 2 P.M., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held twice every year, usually commencing in January and October, and lasting about nine weeks. Special courses in Neurological Ophthalmology, Neuropathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist.

West End Hospital for Nervous Diseases

This institution is recognised by the University of London and by the Conjoint Board as a school of instruction in Neurology for the M.D. degree, Branch III., and for the D.P.M. The Out-patient Department is in Welbeck-street, W.; the In-patient Department is at Gloucester-gate, Regent's Park, and contains 76 beds. Completely equipped with pathological and other special departments, the hospital offers every facility for instruction in Neurological subjects, including courses of instruction for the D.P.M. The hospital coöperates with the Fellowship of Medicine in the programmes of special post-graduate teaching organised by the Association. A concentrated week's course for general practitioners will be held this year from Oct. 21st.–26th. The practice of the hospital is open to students and practitioners by arrangement. Appointments as Hon. Clinical Assistants in the Out-patient Department are open to registered medical practitioners. Two Resident House Physicians are appointed for a period of six months in the first place with remuneration at the rate of £125 per annum. Vacancies March 1st and Sept. 1st. The Savill Memorial Prize (value £15) and Medal are offered biennially for competition among post-graduate students who have attended the practice of the hospital or any special course.

Hospital for Epilepsy and Paralysis

This hospital in Maida Vale, W., contains 88 beds, including 20 private wards and 6 pay beds. Both in-patient and out-patient departments are open free to students, as well as to medical graduates. The out-patient department is open every week-day except Saturday at 2 P.M.

HEART AND LUNGS

Royal Chest Hospital

The Royal Chest Hospital, City-road, E.C., associated with the Royal Northern Group of Hospitals, has accommodation for 84 in-patients and a large out-patient department, open daily. Special departments include Thoracic Surgery, Laryngology, Radiology, Electrocardiograph, Massage and Physical Exercises, and an Ultra-violet Light clinic. Clinical Assistants are appointed to work with the physicians in the out-patient department. The Tuberculosis Dispensary for Islington South is attached to the hospital.

Brompton Hospital for Consumption and Diseases of the Chest

The hospital contains 368 beds, of which 57 are allocated to the Surgical side and 98 to Paying Patients. A further 150 beds are provided at the Sanatorium at Frimley, which also contains beds for paying patients. The beds for paying patients at the hospital are so divided up as to provide Wards of two and five beds each at a small inclusive fee, and single bedrooms in which the fees are non-inclusive. In addition to the resident medical officer there are two resident surgical officers appointed annually; an assistant resident medical officer, who assists in the artificial pneumothorax clinic, and six resident house physicians, whose duties include attendance at the out-patients' and special departments, and one of these serves as assistant to the tuberculosis officer for Chelsea; these officers are appointed for a term of six months each. Post-graduates are admitted to the practice of the hospital. Clinical assistants are appointed to the in-patient and out-patient physicians, the surgeons, and the special departments of the hospital. Clinical demonstrations in the Wards, the out-patient and special departments are given throughout the year, and two special post-graduate courses of one week each and three week-end courses are held annually. Special courses are also held o! the Pathological Department. The medical practice of the hospital is recognised by the Conjoint Board, the University of London, the Apothecaries Society, and the Army and Navy and Indian Medical Boards. Four special courses for students of eight demonstrations each are held during the year before each final Conjoint Board Examination.

City of London Hospital for Diseases of the Heart and Lungs, E.2.

(188 beds). Special Departments: Surgical, Laryngological, Bronchoscopical, Radiological, Pathological, Electrocardiographic. Assistants are appointed to the Clinics, and a limited number of research workers to the Pathological Department. The in-patient staff visit generally in the afternoon; out-patients at 2 P.M. Graduates are admitted on payment of fees which entitle them to attendance at clinics, post-mortem demonstrations, and operations. Special demonstration and lecture courses are provided, and a club room. Graduates desiring Assistantships in any department should address applications to the Head of that department. A Tuberculosis Dispensary (Boroughs of Bethnal Green and part Hackney) is established at the hospital.

National Hospital for Diseases of the Heart

The practice of the hospital, with 46 beds and a large out-patient department, is open daily to post-graduates and others. Systematic courses of instruction, with lectures and clinical demonstrations, are arranged during the winter and summer sessions; in addition an intensive course, of a fortnight's duration, takes place in January, June–July, and October of each year. The hospital is fully equipped with all the modern instruments for the investigation of the diseases of the cardiovascular system, and facilities exist for those requiring practical instruction in electrocardiography, X rays, and other graphic methods. Clinical Assistants in the out-patient department are appointed from time to time.

DISEASES OF WOMEN AND CHILDREN

Hospital for Sick Children

The hospital is situated in Great Ormond-street, W.C., contains 252 beds, and has an Out-patients' Department attended by some 30,000 new cases each year. There are Asthma, Dental, and Rheumatic Clinics. The practice is open to students of both sexes who have completed four years' medical study and also to qualified medical men and women. Special lectures are given at the hospital weekly; details of these appear in the medical notes published from time to time in the columns of this journal. Clinical instruction is given daily by Members of the Honorary Medical Staff. Clinical Clerks are appointed once a month. These appointments are open to students of recognised medical schools. Arrangements have been made with the London School of Medicine for Women for the routine admission of their students for Clerkships in the wards. Time spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge as part of the final curriculum. Facilities are afforded to post-graduates for obtaining theoretical and practical instruction in Clinical Pathology, Bacteriology, and Medical Biochemistry in the Laboratories.

Queen Charlotte's Maternity Hospital and Midwifery Training School

This hospital, formerly Queen Charlotte's Lying-in Hospital, is situated in Marylebone-road, N.W. The hospital receives over 2700 patients annually, besides having a large out-patient department. Medical students and qualified practitioners are received at all times of the year. They have unusual opportunities of seeing obstetric complications and operative midwifery on account of the very large number of primiparous cases—nearly one-half of the total admissions. Clinical instruction is given on the more important cases which present themselves. They also receive valuable instruction in the Antenatal and Child Welfare Departments, where over 4000 patients attend yearly. Special Lecture-demonstrations are given by members of the staff. Certificates of attendance at this hospital are recognised by all the Universities, Colleges, and licensing bodies. Pupil midwives and maternity nurses are received and specially *trained*. A Residential College provides accommodation for students and qualified practitioners (both men and women), and is opposite the hospital, with which it is in telephonic communication.

Arrangements have been made for Medical Students to receive the preliminary instruction in Practical Midwifery recommended by the General Medical Council.

The Isolation Block (30 beds) for Puerperal Fever and Puerperal Pyrexia, which has been built on the new site at Ravenscourt Park, Hammersmith, was opened for the reception of patients in September, 1930, and the Research Laboratories, which have been erected adjoining this block, are in full working order. Students may attend the clinics conducted by the staff at the Isolation Block, and demonstrations are also given at the Research Laboratories.

City of London Maternity Hospital and Midwifery Training School

This hospital (City-road, E.C.) receives nearly 1700 in-patients annually, in addition to attending mothers in their homes. Pupil Midwives and Maternity Nurses receive the recognised course of training, assisted by a Sister Tutor. Monthly or fortnightly residential courses are provided for two Medical Students at a time and facilities are offered to post-graduates to see the work of the Antenatal Clinics on three mornings weekly. For the benefit of post-graduates, occasional week-end courses are arranged through the Fellowship of Medicine. Refresher courses are provided for Practising Midwives.

Royal Waterloo Hospital for Children and Women

This hospital has now 130 beds, while the latest buildings include a Nurses' Home and private pay beds. It has a full staff of surgeons, physicians, and gynæcologists, and also special departments. Amongst the many valuable additions to the equipment of the hospital is an Electrocardiograph apparatus. A newly equipped Orthopædic Department is in use, and the Physiotherapeutic and Electrical Department has been extended and re-equipped. There are facilities for post-graduates to attend the general and special clinics in medicine and surgery for in-patients, and for out-patients, including a genito-urinary clinic, a clinic for varicose veins, a L.C.C. Clinic for children suffering from rheumatic fever and chorea, and the X ray department for gastro-intestinal diagnosis. Particulars of post-graduate courses, which are held from time to time, can be obtained from the Secretary of the hospital.

Victoria Hospital for Children

This hospital in Tite-street, Chelsea, S.W., contains 138 beds and a large out-patient department; the home at Broadstairs has 50 beds. There are two private wards where patients may be under the care of any medical practitioner holding an appointment on the staff of a recognised hospital, and the question of payment for his fees is arranged between him and the child's parents.

Queen's Hospital for Children

This hospital, for the sick children of the poor up to 14 years of age, was formerly known as the North-Eastern Hospital for Children. There are 160 beds in London (Hackney-road, E.2) and 44 at the seaside branch, Little Folks Home, Bexhill. Special departments in Ear, Nose, Throat, Skin, and Eye, and Dentistry. Rheumatic Clinic in coöperation with L.C.C. schools twice weekly. A radiologist attends four times weekly. There are massage and light departments, and a special whooping-cough physician. The practice of the hospital is open to students by arrangement with the medical staff.

Paddington Green Children's Hospital

This is a hospital of 52 beds, with a large out-patient department and a full staff, with Eye, Ear, Skin, Light, Psychology, Rheumatism, X ray, and Dental departments. The facilities which it offers for observation of clinical practice are used by the Fellowship of Medicine.

Hospital for Women, Soho

This hospital in Soho-square, W., contains 81 beds. The teaching is available for post-graduates only in limited numbers. Operations take place on Mondays and Fridays at 9.30 A.M., Tuesdays and Thursdays at 2 P.M., and Wednesdays and Fridays at 3 P.M. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated is the London School of Gynæcology, comprising attendance in out-patient department, operating theatre, clinical lectures, and X ray treatment.

Samaritan Hospital for Women

Contains 88 beds. Qualified practitioners are admitted as clinical (gynæcological) assistants to both the in- and out-patient departments. Full particulars may be obtained from the Secretary to the Medical Committee at the hospital, Marylebone-road, N.W.

cess Elizabeth of York Hospital for Children

The hospital in Shadwell, E.1, has 135 beds. Clinical instruction in pædiatrics is given to the fifth-year students in Glamis-road, Shadwell, E.1. Two clinical clerkships for students or medical men for a period of three months are available. Clinical assistants are, from time to time, appointed in the out-patient department. There is an orthopædic clinic on Wednesdays and a rheumatic clinic on Saturdays. Physicians and surgeons pay ward visits every morning and periodical intensive courses in pædiatrics, medical and surgical, are given. From time to time post-graduate courses are arranged at the hospital by the Fellowship of Medicine, when most of the honorary staff give lectures. The hospital is always ready to arrange these courses.

An appeal has been launched to build a hospital and convalescent home on an estate at Banstead, which has recently come into the possession of the institution. The present convalescent home, now at Bognor, will be transferred to Banstead, and the whole will be under the charge of the honorary staff, when further facilities for post-graduate instructions will be offered.

Chelsea Hospital for Women

This hospital has 104 beds; 18 for patients paying £5 5s. a week and moderate fees to the surgeons for operations. There is a convalescent home of 32 beds at St. Leonards. In the out-patient department the patients are seen at a nominal payment or with subscribers' letters. The hospital caters for post-graduate teaching. In the out-patients' department clinical assistantships can be obtained which entitle the holder to attend and examine patients under the instruction of the visiting surgeons. The operating theatre is open to visitors, and all operations are demonstrated and discussed by the surgeons. The Pathological Department contains one of the finest gynæcological museums in the country. Special intensive courses, with lectures and special demonstrations, are held three times a year through the organisation of the Fellowship of Medicine.

Evelina Hospital and Belgrave Hospital

The Evelina Hospital, Southwark (80 cots), and the Belgrave Hospital (76 cots), Clapham-road, also give facilities for out-patient practice.

CANCER

Cancer Hospital (Free)

The hospital, situated in Fulham-road, S.W., contains 129 beds for poor persons afflicted, who are admitted free. The Out-patient Department is open every week-day, except Saturday, at 2 P.M., also Wednesday morning at 10 and Saturday morning at 11. A course of study in Physics and Radiology, qualifying for the Diploma in Medical Radiology, is given. The hospital is a recognised teaching school of the University of London, in Medical Radiology, Experimental Pathology, and Pathological Chemistry. Senior and Junior Resident House Surgeons are appointed for a period of six months at a salary at the rate of £100 per annum.

Mount Vernon Hospital

The hospital contains 130 beds for surgical cancer cases. Clinical Demonstrations are given by the visiting Surgical Staff at the hospital at Northwood. Clinical assistants are appointed to surgeons in the wards. Diagnostic and follow-up departments, 14, Riding House-street, W. Further information can be obtained from the Secretary, 32, Fitzroy-square, W.

Marie Curie Hospital

This hospital, which is officered by medical women, is a radium centre for the treatment of women suffering from cancer and allied diseases. The In-patient Department contains 39 beds, of which eight are for private patients. There is a daily Out-patient Clinic to which cases are sent for diagnosis and at which the cases already treated by radium are kept under observation. A department for deep X ray therapy was opened in January, 1934. A radiographic department will be in working order immediately. The practice of the hospital is open to graduate visitors, and one graduate wishing to study the subject of radiology is accepted for full-time service for four to six months.

OPHTHALMOLOGY

Royal London Ophthalmic Hospital

The attendance at Moorfields Eye Hospital (Moorfields, 1804–1899), City-road, E.C. (152 beds), is now very large. Operations are performed each day from 10 A.M. to 1 P.M. and four surgeons attend daily. Students are admitted to the practice of the hospital and special courses of instruction are given, which extend over a period of five months, by members of the surgical staff and certain outside lecturers, beginning in October and March. The instructions and classes are arranged to meet the requirements for the various diplomas in Ophthalmology, both for the preliminary examinations in Anatomy, Physiology, and Optics, and those subjects required in the second part. Students of the hospital are eligible as house surgeons, out-patient officers, and clinical assistants. The senior resident officer and three house surgeons are appointed every six months. Twenty-four out-patient officers are appointed each year. Clinical assistants are appointed every three months. The rebuilding of the Out-patients' Department, Medical School, and Private Wards is now completed, and the building is in use. All these departments are now very much improved, as well as the arrangements for instruction.

Royal Westminster Ophthalmic Hospital

This hospital, in Broad-street, Holborn, W.C. (88 beds, including 14 rooms for paying patients), has removed from its original site at Charing Cross to much larger premises, well adapted for teaching purposes. The clinics are held in the afternoons from 1.30 P.M. Operations are performed daily in the theatre at 3 P.M. Lectures and practical classes in the various branches of Ophthalmology, including Operative Surgery, Bacteriology, and Pathology, are held during the winter and summer sessions at 5 P.M. The practice of the hospital is open to both men and women practitioners, and medical students. Post-graduate students at the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction officer (seven appointments paid), and senior and junior assistants.

Royal Eye Hospital

There are 46 beds at this hospital, which is situated in St. George's-circus, Southwark, S.E., and an annual attendance of 68,000 patients. The staff attend daily, Mondays to Fridays at 2 P.M., and on Saturdays at 9.30 A.M., when clinical instruction is given. Special classes held in May and October are planned to meet the requirements of students preparing for the D.O.M.S. and similar examinations, and cover Anatomy, Physiology, Optics, Clinical Ophthalmology, Operative Surgery, and Pathology. Clinical Classes in medical ophthalmology are held for candidates for the M.R.C.P. examinations. A Course suitable for general practitioners is held in April under the auspices of the Fellowship of Medicine. Apart from the Honorary Staff of six Surgeons, there are also a Pathologist, a Bacteriologist, two resident House Surgeons, 12 Chief Clinical Assistants, 24 Clinical Assistants, 14 L.C.C. Refraction Officers, 10 Hospital Refractionists, and an officer in charge of the Squint Training Clinic. Reference departments for general medicine, neurology, dental treatment, ear, nose, and throat investigations, orthoptic training, and radiology, including ultra-violet therapy, are available. The pathological and bacteriological departments are available to ophthalmic surgeons and institutions desiring reports on specimens, cases of interest being dealt with without charge. A Research Scholarship in Ophthalmology to the value of 100 guineas per annum is awarded yearly.

Central London Ophthalmic Hospital

This hospital, in Judd-street, St. Pancras, W.C., has 51 beds, and clinical teaching is given daily. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. An Orthoptic Department for the treatment of cases of squint has been established, and pupils are taken for training in this work. Voluntary ophthalmic clinics are held on Mondays and Thursdays at 4.30 P.M. Ten private rooms are available for private patients. A department for research into and development of the corneo-plastic surgery of the eye has recently been established.

GENITO-URINARY AND VENEREAL DISEASES

London Lock Hospital and Home

There are 74 beds for men, women, and children. Male out-patients are seen at 91, Dean-street, Oxford-street, W.1, at any time from 10 A.M. until 10 P.M. daily (Sunday, noon–10 P.M.). Intravenous injections are given at every clinic. Irrigations for males are given daily from 9 A.M. to 10 P.M. Female out-patients and children are seen daily at 283, Harrow-road, Paddington, W.9, from 9 A.M. until 8 P.M. Irrigations for females are given at any time. The hospital is linked up with the Fellowship of Medicine; special courses of lectures are held in May and November each year, and application for tickets should be made direct to the Secretary of the Fellowship. Only a limited number of practitioners and students are permitted to attend the practice of the Female Lock Hospital, and application should be made to the Dean at the Male Lock Hospital between the hours of 11 A.M. and 5 P.M.

St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum

At St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum, City-road, E.C. (founded 1835), for men and women, there are 63 general beds and 9 private beds. Operations are performed on Mondays, Tuesdays, Wednesdays, and Thursdays at 2 P.M. and Saturdays at 11 A.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Four weekly courses are held during the year in coöperation with the Fellowship of Medicine.

St. Peter's Hospital for Stone

The hospital in Covent Garden is thoroughly up to date in all departments, and research is still carried out with radium specially loaned for the purpose by the British Empire Cancer Campaign. Medical practitioners and students are invited to attend the practice of the hospital in the out-patient department, excepting that the only clinic open to medical women is that held at 9.30 A.M. Fridays for women and children. The operating theatre is open to medical visitors as follows: Mondays, Tuesdays, Thursdays 2 P.M., Fridays 2.30 P.M. Special courses of lectures and demonstrations lasting a fortnight are held periodically by arrangement with the Fellowship of Medicine.

All Saints' Hospital

The in-patient department of the All Saints' Hospital for Genito-Urinary Diseases is at Austral-street, West-square, St. George's-road, S.E., contains 55 beds, including those in 4 private wards and cubicles, and the terms of admission are free or by payment according to means. The out-patient department provides clinical instruction through the Fellowship of Medicine, in addition to which demonstrations in cystoscopy and other branches of genito-urinary work are available for all medical practitioners at the out-patient department on Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday afternoons at 2 P.M., without fee.

ORTHOPÆDICS

Royal National Orthopædic Hospital

This institution, situated in Great Portland-street (480 beds), is a good example of the fusion of scattered activities for the creation of an effective whole. The three orthopædic hospitals of the metropolis were combined for the formation of this central institution at the instance of King Edward's Hospital Fund, with the result that the grants from this Fund and the income from subscriptions can now be used to far better purpose and with economy. The hospital has also been approved by the Ministry of Health for the treatment of surgical tuberculosis, the connexion between orthopædics and the therapeutics required in many forms of tuberculosis having become obvious. Country branch at Brockley Hill, Stanmore (280 beds). Both branches of the hospital are residential schools for physically defective children, certified by the Board of Education. A post-graduate course of 14 days is held about March each year. The out-patient department (entrance in Bolsover-street) is open every week-day, except Saturday, at 1.30 P.M. The Evening Clinic on Tuesdays from 6 P.M. to 8 P.M.

EAR, NOSE, AND THROAT

Central London Throat, Nose and Ear Hospital

This hospital in Gray's Inn-road (78 beds) is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinic. Lectures each Friday at 4 P.M. Courses in Anatomy and Physiology for Part I. of the D.L.O. Examination by a Teacher of Anatomy and Clinical Courses by the Honorary Medical Staff for Part II. of the Examination are given twice yearly, in May and October. In addition there are Peroral Endoscopy and Pathology and Bacteriology classes. Courses in methods of Examination and Diagnosis are given at frequent intervals during the year. Clinical Assistants are appointed and are expected to hold office for at least three months. They are required to attend twice weekly at 1.30 o'clock for the afternoon, and at 4.30 o'clock for the evening clinics. New wing, with complete out-patient department and additional wards, was opened in August, 1929, and a Recovery Home at Ealing with 26 beds was opened in July, 1933.

Golden-square Throat, Nose, and Ear Hospital

The hospital (101 beds), which has absorbed the London Throat Hospital, is situated in Golden-square, near Piccadilly Circus. Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 4 P.M., and on Tuesdays and Thursdays from 6.30 to 7.30 P.M. There is an annual out-patient attendance of 40,000. Minor operations are performed on Wednesdays and Fridays at 9.30 A.M. The hospital now contains 101 beds, of which 11 are for private patients. There is also semi-private accommodation at 4 guineas a week inclusive. Practitioners and post-graduate students are admitted to the practice of the hospital, and clinical assistants are appointed periodically.

Metropolitan Ear, Nose, and Throat Hospital

The hospital is in Fitzroy-square and contains 22 beds. The out-patient department is opened daily at 2 P.M., Saturdays 1 P.M., to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Tuesdays, Wednesdays, Thursdays, and Fridays at 10 A.M. Clinical Assistants are appointed as vacancies occur.

SKIN

London School of Dermatology

The London School of Dermatology, St. John's Hospital for Diseases of the Skin, has an in-patient department (40 beds) at 262, Uxbridge-road, W., and out-patient clinics, at 49, Leicester-square, W.C.2, are held daily at 2 and 6 P.M. (Saturdays 2 P.M. only), when demonstrations are given on the cases presenting themselves. The Chesterfield Lectures, constituting a systematic course in dermatology, are given on Tuesdays and Thursdays at 5 P.M., during October and November and January and February, by the hon. medical staff of St. John's Hospital and the physicians in charge of the Dermatological Departments of the London Teaching Hospitals. The lectures are free to those attending the practice of the hospital and to registered medical students. At the end of the course an examination is held for the Chesterfield Medal in Dermatology, and is open to all medical practitioners. A summer course of lectures is also held during the month of May each year. The electrical department is open, Monday to Friday inclusive, from 2 to 7 P.M. Laboratory Courses in the Pathology and Bacteriology of the Skin can be arranged.

London Skin Hospital and Hospital for Diseases of the Skin

The hospitals admit graduates to their practice, which is among out-patients. London Skin Hospital, daily at 2 P.M. and 5.30 P.M., Saturdays 2 P.M. only. Hospital for Diseases of the Skin, daily at 2 P.M., and Fridays, 5.30 P.M., not on Saturdays.

CENTRES OUTSIDE LONDON AFFORDING EDUCATIONAL FACILITIES

Nearly every hospital of a general character in the country having more than 150 beds falls within this category, and certain of them have already been noticed in connexion with the universities to which their clinical practice is attached. The hospitals vary much in size and scope.

The following alphabetical list includes the provincial hospitals which are recognised by the English Conjoint Board for a part of the required training in medical and surgical practice through clerkships and dresserships. Further information can be obtained from the secretaries of the institutions.

Bath Royal United Hospital

This hospital contains 284 beds of modern construction, 72 of which are for paying patients only; possesses X Ray, Massage, Bacteriological Departments; a Pathological Laboratory, Obstetric and Gynæcological, Ear, Nose, and Throat, and Skin and Neurological Departments. Secretary-Superintendent: Mr. J. Lawrence Mears. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), at 5 P.M. The appointments of house surgeons are recognised by the Royal College of Surgeons to qualify candidates for the Final Fellowship examination. A post-graduate course is held every autumn and a programme of clinical ward rounds is carried out during the first six months of each year.

Bedford County Hospital

This hospital at Bedford has 124 beds, including 15 beds in the paying and 13 beds in the maternity wards; Ear, Nose, and Throat Departments, and X Ray and Pathological Departments. There is in connexion with the institution a convalescent home (20 beds) at Aspley Heath, near Woburn Sands. The hospital is approved by the English Conjoint Board for the examinations.

Berkshire Royal Hospital

This hospital at Reading, which contains 274 beds, includes an Out-patient Department, a Casualty Department, an X Ray and Radiotherapeutic Department, Electrotherapeutic and Massage Department, an Orthopædic Department, an Orthoptic Clinic, a V.D. Clinic, a Laboratory, an Eye Theatre, Eye Wards, a Maternity Ward, a Paying Patients Unit, and a Private Nursing Staff, and two motor ambulances. The hospital is approved as a Training School for Nurses and by the Ministry of Health for V.D. Treatment. The Blagrave Branch, Calcot, contains in addition to the above 64 beds for cases of disease of bones and joints and those requiring open-air treatment.

Bradford Royal Infirmary

This hospital at Bradford contains 223 beds and, in addition, has 50 recovery beds at the Woodlands Convalescent Home, Rawdon. The acting staff consists of 4 Honorary Physicians, 4 Honorary Surgeons, 1 Honorary Radiologist, 1 Honorary Laryngologist, 1 Honorary Ophthalmic Surgeon, 1 Honorary Dental Surgeon, 1 Honorary Assistant Dental Surgeon, 2 Honorary Assistant Physicians, 2 Honorary Assistant Surgeons, 6 Anæsthetists, 1 Pathologist, 1 Physician-in-charge of Radium Therapy Department, 1 Resident Surgical Officer, 1 House Physician, and 4 House Surgeons. There are special clinics for Orthopædic cases, for Electro-therapeutic and Sunlight Treatment, and for Radium Therapy cases. A new hospital of 336 beds is in construction, and a self-contained block for 70 paying patients has been opened adjoining the new Infirmary.

Coventry and Warwickshire Hospital

There are 307 beds available at the Main Hospital at Coventry (established 1840), and 40 beds at the Alcock Convalescent Hospital, Keresley (three and a half miles distance), which is used as an annexe. At the Main Hospital there are separate Medical, Surgical, Maternity, Children's, and Accident Wards, also separate Ophthalmic Block complete with its own Theatre. There are separate departments for Clinics for Ear, Nose, and Throat Diseases, X Ray, Electrical, and Sunlight Clinics, also V.D. Clinic. There is also an up-to-date Pathological Laboratory and Cardiograph Department. The hospital is recognised for the D.O.M.S. and the D.L.O.

Derbyshire Royal Infirmary

This general hospital at Derby (362 beds) was rebuilt in 1892–94. In recent years there have been numerous alterations and additions to keep pace with modern requirements. The hospital is built on the pavilion system and provides, in addition to the usual Medical and Surgical blocks, a separate Ophthalmic block of 40 beds, a separate Children's block of 34 beds (Medical and Surgical), Gynæcological Wards, and an Ear, Throat, and Nose Department. There is a large and well-equipped Out-patient Department, also separate Orthopædic, X Ray, Electrical, Pathological, and Venereal Diseases Departments. The salaried Medical Staff consists of a non-resident Staff of 1 Surgeon-in-charge of X Ray and Electrical Departments, 1 Surgeon-in-charge of Venereal Diseases Department, 5 Anæsthetists, and a Resident Staff of 4 House Surgeons, 1 House Physician, and 1 Assistant House Surgeon and Casualty Officer. Registered Medical Students are admitted to witness the medical and surgical practice on payment of fees.

Devon and Exeter Royal Hospital

The hospital at Exeter contains 230 beds (including special children's wards) and has a good library, museum-post-mortem room, and pathological laboratory. A new Out-patients' Department is in course of completion. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. Sun balconies were added in 1933 to this wing. The "Victory" wing is for the treatment of discharged disabled soldiers and sailors. The Electrical Department now forms one of the most important sections of the hospital. At the department for the treatment of genito-urinary diseases there are three sessions per week, two for men at 3 P.M. and 7 P.M., and one for women at 3 P.M. Doctors in practice may use the museum and library.

Prince of Wales's Hospital, Plymouth

The institution incorporates and amalgamates the South Devon and East Cornwall Hospital, Plymouth (240 beds), the Central Hospital, Plymouth (50 beds), the Royal Albert Hospital, Devonport (60 beds). Special departments include: Pathological, X Ray, Deep Therapy, Cardiographic, Ultra-violet Rays, Electrotherapeutic, Orthopædic, Gynæcological, Aural, Dental, Ophthalmic, and Neurological; also Medical and Surgical Out-patients. Pensioners are received as in-patients and are also treated as out-patients. The hospital has been approved by the National Radium Commission as a Regional Centre for the South-West; and a self-contained unit of 26 Pay Beds and Theatre Suite is now provided.

West of England Eye Infirmary

Students of the Exeter hospital can attend the practice of the Eye Infirmary (55 beds). A ward is set aside for newly born babies suffering from infectious eye diseases. Mothers with babies are accommodated.

Gloucestershire Royal Infirmary and Eye Institution

This hospital at Gloucester has 224 beds. Secretary: F. J. Symons. An Electrical and Massage Department has been established and Venereal Clinic opened. Also Ear, Nose, and Throat Department, X Ray, Electrocardiograph, and Ultra-violet Ray Departments, Orthopædic Department, Dental Department, Pathological Laboratory, and Neurological Clinic. Sixteen beds for paying patients in new block.

Hampshire Royal County Hospital, Winchester

This hospital, which was founded in 1736, contains 173 beds. There is a private nursing staff attached. The building and amenities are completely up to date; there are an efficient Out-patient Department, a Pathological Laboratory, Paying Patients Wards, and an Electrical and Massage Department. A new Children's Block has been opened.

Hull Royal Infirmary

This hospital contains 267 beds, plus 100 beds at the branch hospital at Sutton-on-Hull, and has undergone steady additions and improvements, including up-to-date Ophthalmic, Radiological, Nose, Throat, and Ear, Dental, V.D., Violet Rays, and Pathological Departments, and a Clinic for Functional Nervous Diseases was opened in 1931, under the Mental Treatment Act, 1930. Extensions in recent years include a new Operating Theatre, Nurses' Home, and extensions to the old X Ray, Electrical, and Out-patient Departments. The Resident Staff consists of 1 Resident Surgical Officer, 2 House Physicians, 3 House Surgeons, 1 Surgeon to Special Departments, 1 Casualty Officer. Sutton Branch: 1 House Surgeon and 1 House Physician. An annexe at Withernsea has accommodation for 30 patients. The two house physicians' appointments, and that of the house physician at the Branch hospital, are recognised by the University of London for the M.D., Branch I. (General Medicine) examination. It also recognises the posts of senior house surgeon, second house surgeon, and house surgeon of the Branch hospital, for the M.S., Branch I. (General Surgery) examination. The post of house surgeon to the Special Departments is recognised by the Conjoint Board of the Royal Colleges for the examinations for the Diplomas in Ophthalmic Medicine and Surgery, and Laryngology and Otology. The hospital is also recognised by the Royal Colleges for the F.R.C.S. examinations.

Kent and Canterbury General Hospital

The hospital at Canterbury contains 137 beds. Pupils of the staff are admitted to the practice of the hospital. Operations daily. Special departments include Ophthalmic, Ear, Nose and Throat, Venereal, Orthopædic, Electrical, Actinotherapeutic, X Ray, and Bacteriological. Accommodation for paying patients is available. The hospital is recognised for the purpose of M.D. and M.S. examinations.

Leicester Royal Infirmary

At the Leicester Royal Infirmary there are 486 beds (children's 80 and venereal diseases 15); 92 additional beds are retained at local convalescent homes for the reception of pre-convalescent cases. A rebuilding scheme has been carried out providing modern operating theatres, three new wings, a self-contained out-patients' department, pathological laboratories and post-mortem rooms, and special departments. The Children's Hospital was reconstructed and enlarged, and the Nurses' Home recently enlarged to accommodate 220 nurses at a cost of £55,000. There are 13 resident salaried medical officers—viz., four house surgeons, two casualty officers, three house physicians, three anæsthetists, one dresser. The posts are filled half-yearly—April and October—and afford exceptional opportunities for post-graduate experience. Senior students are appointed as dressers and are given an honorarium (applications to the House Governor and Secretary). A post-graduate course of lectures is arranged annually by the Leicester Medical Society, and clinical classes are held for graduates preparing for M.D. and M.R.C.P.

Norfolk and Norwich Hospital

This hospital at Norwich has at present 417 beds. There is a convalescent home with accommodation for 35 patients at Cromer. The Resident Medical Staff consists of one House Physician, three House Surgeons, one House Surgeon to the Ear, Nose, Throat, and Eye Department, and two Casualty Officers. There is also a Private Patients' Home which has at present 25 beds. Students are admitted to the practice of the hospital for a fee of £5 5s. for six months.

Northampton General Hospital

In 1926 a new isolation block of 30 beds was opened. The number of beds is 301. There is an up-to-date Pathological Laboratory; also X ray and therapeutic department and V.D. clinic. Two new operating theatres have been built, and a new ophthalmic in-patient department has recently been completed, also a new deep X ray therapy department. A maternity department is in course of construction and a new children's department and ear, nose, and throat department are being contemplated, also more bedrooms for nurses and a new out-patient department.

Nottingham General Hospital

There are at this hospital 386 beds available for medical and surgical patients, and 110 beds are in the detached branch, known as "The Cedars" Branch of the General Hospital. The honorary staff includes 3 Physicians, 2 Assistant Physicians, 4 Surgeons, 2 Assistant Surgeons, 2 Aural Surgeons, Surgeons in charge of Radium-therapy and Orthopædics, a Physician in charge of the Skin and Ultra-violet Light Departments, a Radiologist, Pathologist, Anæsthetists, and Surgeon-Dentist. The special departments are the Ear, Nose and Throat, Skin, Pathological Dental, Massage, X Ray, Deep X Ray Therapy, Orthopædic, Electrotherapeutic, Ultra-violet Light. The Resident Medical Staff consists of 2 House Physicians, 4 House Surgeons, 1 Aural House Surgeon, and 2 Casualty Officers. The hospital is a recognised training school for nurses.

Portsmouth Royal Hospital

The hospital contains 250 beds. There are Medical, Surgical, X Ray, Massage, Gynæcological, Orthopædic, and Urological Out-patients' Departments. Further particulars may be obtained from the Secretary.

Preston and County of Lancaster Queen Victoria Royal Infirmary

This is a General Hospital with 365 beds, including 72 at two Homes of Recovery. In addition to the Medical and Surgical Wards, there are special wards for Eye, Ear, Nose, and Throat conditions and Venereal Diseases, also a Maternity Department (recognised by the Central Midwives Board). The special departments include Bacteriological, Pathological, Biochemical, X Ray, including Superficial Deep Therapy, Electrocardiograph, Light (including Finsen installation), Neurological, Electrotherapeutical, Ophthalmic, Aural, Orthopædic, Dental, Venereal Diseases (including daily intermediate treatment). Radium treatment is given at the hospital in conjunction with the Manchester Radium Institute. The Visiting Staff consists of 5 Surgeons (4 in consulting practice), 1 Orthopædic Surgeon, 3 Physicians, 3 Radiologists, 2 Eye and Aural, 1 Pathologist, 3 Anæsthetists, 1 Medical Officer to Electrotherapeutic Department, and the Resident Staff—R.S.O., 3 House Surgeons, 1 Casualty Officer, 1 House Physician.

Royal Sussex County Hospital

This (general voluntary) hospital at Brighton has 250 beds and possesses a large out-patient department, including Dental, Dermatological, Ear, Nose, and Throat, X Ray, and Electrotherapeutic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital on payment in advance of such fees as may be arranged.

Salisbury General Infirmary

This hospital at Salisbury contains 101 beds. Maternity and antenatal ophthalmic wards; and ear, nose, and throat wards; maternity and child welfare clinic. The buildings are now in course of reconstruction. In the extended hospital there will be 225 beds, and there will be 15 new single-bed paying wards, increased ophthalmic in-patient accommodation as well as new and enlarged out-patient accommodation.

Salop Royal Infirmary

This hospital at Shrewsbury contains 185 beds, including a very modern children's ward unit with a special maternity unit for difficult maternity cases. Extensive alterations are at present in progress and will ultimately increase the beds of the hospital to 200, and will include a new double operating theatre unit. A new private patients' wing is also being erected, together with a large pathological institute, which although attached to the hospital will become the central pathological institute for the county of Shropshire. The staff consists of the following honorary officers: 1 consulting physician; 2 consulting surgeons, 3 physicians, 3 surgeons, 3 anæsthetists, 1 obstetric surgeon, 1 radiologist, 1 physician in charge of electrocardiograph department, 1 consulting ophthalmic surgeon, 1 ophthalmic surgeon, 1 consulting alienist, 1 health officer, 3 dental surgeons, and 4 resident officers. The special departments are: electrocardiograph, X ray, massage, electrical therapeutics, ultra-violet ray. There are large out-patients', accidents, and casualty departments.

South Hants and Southampton Royal Hospital

This hospital at Southampton contains 275 beds with every facility for clinical instruction. There have been many alterations and additions in recent years and further extensions are at present in process. The Staff consists of: 4 Honorary Physicians, 4 Honorary Surgeons, 3 Honorary Anæsthetists, 2 Honorary Radiologists, 2 Honorary Ear, Nose, and Throat Surgeons, 1 Honorary Dermatologist, 3 Honorary Dental Surgeons, 1 Pathologist, 1 Physician in charge of Radium Department, and 6 Resident Officers. Special Departments: Ear, Nose, and Throat, Ophthalmic, Dermatological, Electrocardiograph, X Ray, Massage, and Electricity, Ultra-violet Ray, Radium (Regional Radium Centre), Pathological Institute, and large Out-patient Department. Three House Surgeons' posts are recognised for the final F.R.C.S. and one for the D.L.O.

Staffordshire General Infirmary

This hospital was established at Stafford in 1766 and has over 100 beds, and for many years has been recognised for the twelve months' surgical hospital practice required of candidates admissible to the second examination under the conditions of Section IV., para. 11, Royal College of Surgeons, and is a training school for nurses. Paying patients are accepted.

Staffordshire (North) Royal Infirmary

The New Infirmary opened in 1869 at Hartshill, Stoke-on-Trent, built on the pavilion plan, has accommodation for 389 patients, including Children's wards, and a Private Patients' Department of 33 beds. The Infirmary is a Regional Radium Centre (National Radium Commission), and has the following departments: Bacteriological, Pathological, Biochemical, Ophthalmic, X Ray, Electrotherapeutical (including Ultra-violet Ray Lamps), Electrocardiograph, Aural, Dermatological, Neurological, Orthopædic, Dental, Plastic, and Venereal Diseases Clinics, including daily Intermediate Treatments. Recent extensions comprise a new ward block, new X Ray and Orthopædic Departments, with connecting corridors to the existing Infirmary, large extensions to the nurses' home, new boiler house, new chimney stack, new laundry, new surgery and casualty department, new ophthalmic wards, and a new pay beds department.

East Suffolk and Ipswich Hospital

With 335 beds at the hospital in Ipswich, and 65 at the Home of Recovery, the Bartlet Home at Felixstowe, this Institution possesses a total of 400 beds. Although the work is largely surgical, the Medical Wards in the War Memorial Block are quite modern and well situated. Special departments include a children's block with open-air balconies, a complete Ophthalmic Department with operating theatre and wards, a Gynæcological Ward, Uro-Genital Ward and an Isolation block, a Venereal Disease block and a new ward allocated to motor accidents. A complete Ear, Nose, and Throat unit, consisting of six wards comprising 36 beds with operating theatre and offices, was built last year. An entire new X Ray Department has recently been opened. A private patients' block of 46 beds, 30 of which are in the single-bed rooms, has just been put into commission. A Pathological Building was recently erected at a cost of £12,000. A scheme for the enlargement of the Out-patient Department is in progress. The Resident Medical Staff consists of a Resident Medical Officer who is also Medical Superintendent of the Branch Establishment, a Casualty Officer, House Physician, and four House Surgeons. The hospital is recognised by the Council of the Royal College of Surgeons so far as posts of first and second House Surgeons are concerned. Its pharmacy is recognised by the Pharmaceutical Society for Great Britain for practical training. It is recognised as a training school for nurses.

Surrey Royal County Hospital, Guildford

This hospital, established in 1865, has recently been enlarged and thoroughly modernised and, with the further additions which are now being made, will have accommodation for 220 patients, including a paying ward of 22 beds. It has a ward for children, a special operating block with two theatres, anæsthetic, sterilising, and pathological rooms; a large out-patient and casualty department; a fully equipped X ray department and special departments for massage and light treatment. There is a separate pathological block in which every form of investigation necessary for diagnosis and treatment is carried out. There are special departments for orthopædics, diseases of women, of the eyes, of the ears, nose, and throat, of the teeth, and of the nervous system, each being under the charge of a consultant, and in addition there is an Honorary Visiting Staff of four Physicians and four Surgeons as well as four Resident Medical Officers. A resident post at the hospital is recognised as qualifying for admission to the final examination for the F.R.C.S. and the hospital is also a training school for nurses. In the year 1934 the number of in-patients was 2649 and of out-patient attendances, 37,959.

Wolverhampton—The Royal Hospital

There are 300 beds. Special departments: Children, Gynæcology, Maternity, Ear, Throat, and Nose Diseases, Electrotherapeutic and X Rays, Orthopædics, Artificial Sunlight, Venereal Disease, Pathological and Biochemical Laboratories, Dentistry, Radium, Skin Diseases, Psychiatric Clinic, and Electrocardiograph. There is an excellent medical library. The Resident Staff consists of Resident Assistant Surgeon, Resident Assistant Pathologist, one House Physician, and five House Surgeons. Women's Department, one Resident Obstetric Officer and one House Surgeon. Pupils are allowed to witness the whole of the practice of the hospital, and to be present at operations, and have every opportunity of acquiring a practical knowledge of their profession. The hospital is recognised by the various Examining Bodies for a part of the requisite attendance on Medical and Surgical Practice. A course of Practical Pharmacy is given by the Pharmacist. Fees on application. Applications should be made to the Honorary Secretary of the Medical Committee.

Worcester Royal Infirmary

The hospital has 165 beds. An obstetric department and side wards were opened last year and increased the bed accommodation by 16. In 1932 a new wing was added consisting of two operating theatres and a complementary suite of rooms, an Orthopædic and Electro-massage Department, a Pathological Laboratory, an Ear, Nose, and Throat Ward, a Mortuary, Post-mortem Room, Viewing Chapel, and Inquest Room. A new Nurses' Home was also opened in 1932, providing accommodation for Matron, 10 Sisters, and 50 Nurses. The Resident Medical Staff has been increased to three, and a house in the Infirmary grounds has been furnished and equipped for them. All hot water and steam services are run on oil fuel. There is a Department for Venereal Diseases, and Surgical Tuberculosis cases are treated. There is also a Mental Out-patient Clinic.

York County Hospital

This hospital at York contains 200 beds. There are balconies for outdoor treatment, X Ray Department, Orthopædic, Dental, Electrotherapeutic and Massage Departments, actinotherapy installation, and clinical laboratories. There are clinics for Functional Nervous Disorders, Dermatological Disorders, Venereal Diseases, and Electrocardiography.

A new women's surgical ward of 20 beds and a new out-patient department was opened in October, 1934. New clinics for children, heart cases, and skin complaints were started Jan. 1st, 1935.

MEDICAL EXAMINING BODIES AND SCHOOLS IN SCOTLAND

UNIVERSITY OF ABERDEEN

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., *M.D.*, *Ch.M.*, *M.B.*, and *Ch.B.* The Degree of Doctor of Philosophy (*Ph.D.*) is also granted in the Faculty of Medicine.

Degrees of M.B. and Ch.B.—Candidates, before entering on the curriculum, must have passed the Preliminary Examination or hold a qualification recognised as exempting from such examination.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Biology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Forensic Medicine, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital, they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem Examinations, Venereal Diseases, Tuberculosis, Radiology, X Ray Therapeutics and Electrical Treatment, and Clinical Chemistry, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A Thesis (in duplicate) has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

Degree of Ph.D.—For this degree candidates must pursue a course of special study or research during a period of nine academical terms as Research Students in the University of Aberdeen or in any College or Institution that may be affiliated thereto. A Thesis (in duplicate) must be presented for approval.

A Diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 80 Bursaries (competition and presentation) ranging in value from £30 to £50 per annum, most of them being tenable from three to five years. Scholarships: five Post-graduate Scholarships, ranging in value up to £250 per annum. Numerous Prizes and Gold Medals reward proficiency in special departments.

Clinical Studies are carried on mainly at the ABERDEEN ROYAL INFIRMARY. There are 370 beds. The main clinical work of the students is done in the infirmary with its general and special facilities, including a department of clinical chemistry. A dietetic department has recently been established under the direction of a qualified dietitian. A post-graduate course in medicine is given during the summer term.

The ABERDEEN ROYAL MENTAL HOSPITAL contains about 900 beds, and a class of mental diseases meets at the University of Aberdeen, and clinical instruction is given at the hospital.

Students also receive clinical instruction at the following institutions: City Fever Hospital, Sick Children's Hospital, General Dispensary, Lying-in and Vaccine Institutions, and the Ophthalmic Institution.

UNIVERSITY OF EDINBURGH

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—viz., *M.B.*, *Ch.B.*, *M.D.*, and *Ch.M.* The degree of *Ch.B.* shall not be conferred on any person who does not at the same time obtain the degree of *M.B.*, and the degree of *M.B.* shall not be conferred on any person who does not at the same time obtain the degree of *Ch.B.* No one is admitted to the degrees who has not been engaged in study for five years.

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended courses of instruction in Clinical Surgery and Clinical Medicine each of nine months, and courses of instruction in all the subsidiary subjects. They must have attended a course in Clinical and Practical Midwifery and have personally conducted at least 12 cases of labour. Residence for a period of at least five weeks in a hostel in close proximity to the Maternity Hospital is also required.

With respect to the places and institutions at which the studies of the candidates may be prosecuted the following regulations have effect: Three of the five years of medical study must be spent in the University of Edinburgh. The remaining two years may be spent in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University or medical school recognised for the purpose by the University Court. Women are admitted to graduation in medicine under the same conditions as men.

Bachelors of Medicine and *Bachelors of Surgery* of not less than 24 years of age may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice. In each case an examination must be passed and a thesis submitted for approval.

Edinburgh Royal Infirmary

Clinical instruction is carried on mainly at this institution. There are 1025 beds, including 71 cots for children. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Diseases of the Skin, Diseases of the Eye, Ear, Nose, and Throat, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat, and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There is also a large and complete Radiological Department in which is given theoretical and practical instruction for the University Diploma in Radiology, &c. In addition to the Out-patient Departments connected with the Surgical and Medical Houses, there are separate Out-patient rooms attached to the Special Departments. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology.

The appointments are: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department.

Among other institutions in which students receive clinical instruction are the following:—

Municipal Hospitals.—The three Municipal Hospitals—the Western General Hospital (300 beds), the Eastern General Hospital (400 beds), and the Northern General Hospital (260 beds)—are available for clinical instruction in Medicine, Surgery, Midwifery, and Diseases of Children throughout each term and during vacation. Accommodation is provided for resident students who act as clinical assistants, and the experience gained by such residence has proved to be a useful addition to the ordinary clinical classes and of great value to the student.

Edinburgh Royal Hospital for Sick Children

This hospital, which is situated within easy distance of the University and the Royal Infirmary, contains about 120 beds, of which 50 are reserved for surgical cases. It is fitted with every modern improvement and has a fully equipped out-patient department for both medical and surgical cases. Clinical instruction is given in the hospital by the professor of child life and health and the university lecturers in diseases of children. The course which includes lectures and clinical teaching covers the care and management of the child in health as well as the medical and surgical aspects of disease in children.

Edinburgh Royal Hospital for Mental Disorders

The 500 beds in this hospital are available for the clinical instruction of members of the university class of psychiatry. Clinical lectures on the chief forms of Mental Disease and Defect are given in the hospital and at the Jordanburn Nerve Hospital and the National Hospital for the Training of Imbecile Children, Larbert. A mental out-patient clinic is also conducted at the Royal Infirmary and students have the opportunity of coming into personal contact with and examining cases. There are resident physicianships and unqualified clinical clerkships in the hospital and a well-equipped laboratory under a bacteriologist is available for the prosecution of clinical research by those holding these appointments.

Edinburgh City Hospital

This hospital has 600 beds for Infectious Diseases. Clinical instruction is given by the university lecturer during each of the three terms of the academic year. In the course special attention is directed to methods of prophylaxis and every opportunity is taken to demonstrate the clinical manifestations of the various diseases at the bedside. Students attend the course in their fourth year after having passed the examinations in Pathology, Bacteriology, Materia Medica, and Therapeutics, and attended courses in Clinical Medicine and Clinical Surgery.

Edinburgh Royal Maternity Hospital

The hospital is situated close to the Royal Infirmary and the University Medical School. Here Midwifery is studied clinically, instruction being given by the professor of midwifery and the other physicians and assistant physicians who are university lecturers on clinical obstetrics. In addition to clinics and demonstrations members of the class are expected to follow all the work of the hospital, including the antenatal department. Before he can qualify for a certificate in the subject each student must reside for a period of at least five weeks in a University Hostel close to the hospital so that he can obtain full advantage of practical instruction on abnormal cases.

Post-graduate Instruction.—In the Departments of the Faculty of Medicine provision is made for research by students of graduate standing. In the University laboratories facilities will be provided for approved candidates for the degree of Ph.D. In connexion with the University and Royal Colleges post-graduate instruction is given during each of the three terms of the academic year as well as the summer vacation. In addition to a four weeks' General Surgical Course and a General Practitioners' Course of similar duration in August–September, special courses in Obstetrics and Gynæcology, Diseases of Blood, Endocrinology, Diseases of Nervous System, Urology, Ultra-violet Radiations, Interpretation and Significance of Modern Diagnostic Methods, &c., may be given during July to September. Particulars of these and other courses may be had on application to the Honorary Secretary, Post-graduate Courses in Medicine. Graduates may, if desired, attend the General Surgical Course or the General Practitioners' Course for a period of two weeks at a reduced fee. The University of Edinburgh is especially rich in Scholarships and Prizes in medical subjects. Full particulars concerning these, as well as concerning the fees at different stages, can be obtained from the Dean of the Medical Faculty.

UNIVERSITY OF GLASGOW

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men and women, are conferred: *M.B.* and *Ch.B.* (always conjointly), *M.D.* and *Ch.M.*; *B.Sc.* in Public Health; *D.Sc.* in Public Health; *B.Sc.* in Pharmacy; and *Ph.D.* in the Faculty of Medicine. A Diploma in Public Health (*D.P.H.*) is also granted.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of five years is required. The candidate must attend a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses: Chemistry (including Organic Chemistry), with Practical Chemistry, three terms; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery, two terms; Medicine, two terms. Candidates must attend for at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine with nine months more of general hospital practice; the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have attended a course of Mental Diseases and of Practical Pharmacy (25 meetings), must have been properly instructed in Vaccination at a public vaccination station, and must have attended at least 20 cases of labour and the Practice of a Lying-in Hospital. The University also requires further study in various special subjects: Ophthalmology, Diseases of the Ear, Throat, and Nose, Venereal Diseases, Tuberculosis, Fevers, Vaccination. The final year consists of three intensive terms of study: one devoted to Midwifery and Diseases of Women, one to Surgery, and one to Medicine.

There are four Professional Examinations, the first comprising Botany, Zoology, Physics, and Chemistry;

the second comprising Anatomy and Physiology; the third comprising Materia Medica and Therapeutics and Pathology; and the fourth or final, comprising Medical Jurisprudence and Public Health, Surgery and Clinical Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and the Diseases peculiar to Women and to Infants.

The degrees of M.D. (Doctor of Medicine) and Ch.M. (Master of Surgery) are granted to candidates, not under 24 years of age, who have previously obtained the double bachelorship, on submitting an approved thesis and completing examinations in Clinical Medicine for M.D., and in Surgical Anatomy, operations on the dead body, and Clinical Surgery for Ch.M. The higher degree of Doctor of Philosophy (Ph.D.) is also conferred in the Faculty of Medicine. Candidates must already have obtained a degree (or equivalent diploma) from an approved University or College, and must prosecute a course of special study or research for two or three years and give evidence of satisfactory progress. A thesis must be presented for approval by the Senate on the recommendation of a Special Committee. The candidate may be required to undergo an oral or other examination on the subject matter of the thesis.

Post-graduate Medical Teaching is available under the auspices of Glasgow Post-Graduate Medical Association, which is representative of practically all the Teaching Institutions in Glasgow. Weekly demonstrations for practitioners are given throughout the winter and spring, and comprehensive courses of instruction during the summer and autumn. There is a General Medical and Surgical Course during the last two weeks of August and the first two weeks of September. This is a whole-time course and includes most of the subjects of interest to the general practitioner. Arrangements have been made whereby a limited number of graduates may become attached to wards or out-patient departments nominally as clinical assistants for definite periods throughout the year.

There are many Bursaries, Scholarships, and Prizes in connexion with the Medical Course.

Anderson College of Medicine

Courses are given at Dumbarton-road, Glasgow, W., qualify for all the licensing boards and for niversities of Oxford, Cambridge, London, rgh, and Glasgow (the latter two under certain ons). Extensive *accommodation is provided* actical anatomy, chemistry, *botany, zoology,* iology, pharmacy, and operative surgery. Women dents are admitted *on the same terms as men,* d the Carnegie Trust *extends its benefactions to* tudents of the College. *Candidates for the* L.D.S. can obtain the full medical curriculum; the courses special to dentistry are conducted at the Dental Hospital, Glasgow.

Clinical Studies are carried on at the GLASGOW ROYAL INFIRMARY, the GLASGOW WESTERN INFIRMARY, the VICTORIA INFIRMARY, and other general hospitals in the city. Facilities for the study of special branches are afforded by the Royal Hospital for Sick Children, the Royal Mental Hospital, Hawkshead Asylum, the City Fever Hospitals, the Royal Maternity Hospital, the Samaritan Hospital, the Eye Infirmary, and the Bridge of Weir Sanatorium.

The following are additional centres of instruction:—

Glasgow Western Infirmary

This hospital of 650 beds adjoins the University. Special wards are set apart for diseases of women, throat, nose, and ear, and for affections of the skin. In the out-patient department there are special clinics for diseases of women and for diseases of the throat, ear, nose, teeth, skin, venereal disease, and electrotherapeutics. This is one of the radium centres for Glasgow and the West of Scotland. The clinical courses are given by the physicians and surgeons, each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. In the pathological and bacteriological departments the courses are both systematic and practical, and extend through the winter and following summer; these are likewise recognised by the University for graduation. In addition post-graduate courses are held. Eighteen resident assistants are appointed annually from those who have completed their course. In the Clinical Laboratory students receive laboratory instruction from the lecturer on clinical methods. A new Ophthalmological Department is being erected where special courses will be held.

Glasgow Royal Infirmary

The Glasgow Royal Infirmary is the oldest and largest voluntary hospital in Glasgow. It is situated in the east-end of the city, adjacent to St. Mungo's Medical College, and contains 771 beds, although the daily average number of patients resident in the Infirmary during 1934 was 830. It is a general hospital with 22 wards devoted to general surgery and 10 wards to medicine. The special departments include wards for the treatment of burns, diseases of the ear, nose, and throat, skin diseases, diseases peculiar to women, urological diseases. There are also wards for metabolic examinations and treatment by oxygen therapy. The medical electrical department contains the latest plant, and treatment by electricity, light, &c., and electrocardiographic examinations are also carried out here. The Infirmary is a national radium centre, and has both national radium and radium belonging to itself for the treatment of cases of malignant disease and such other conditions as demand radiation. The orthopædic department includes a large massage department and school of massage for male students. There are also vaccination, dental, and nervous and mental diseases clinics, although beds are not provided for the special use of these clinics. The pathological institute comprises a large pathological block, bacteriological and biochemical departments, and a fully stocked pathological museum.

The Royal Infirmary is a large teaching hospital, recognised by the University of Glasgow and the Royal Faculty of Physicians and Surgeons of Glasgow. The teaching staff includes four professors—namely, of surgery, medicine, pathology, and diseases of women—who hold chairs in the University of Glasgow; nine lecturers appointed by the University; four honorary clinical lecturers in clinical medicine; five honorary clinical lecturers in clinical surgery (all appointed by the University); and numerous assistants to various departments. There are also Hall Fellows specially appointed, who act as clinical tutors. Full facilities are given to medical students for instruction in systematic clinical medicine and surgery, pathology, diseases of women, laryngology, rhinology, otology, &c. There is a very large out-patient department, where there are nearly half a million attendances of patients annually, and facilities are given to students for instruction in the various out-patient clinics and departments. The ophthalmic work is carried on at the ophthalmic institution, containing 36 beds (the institution being under the management of the Infirmary). Facilities are given for medical students to work here, and classes are held qualifying students in ophthalmology, required by the curriculum for the final examinations. Post-graduate classes are also conducted at the Infirmary and the Institution, and post-graduate clinical assistantships are available for a limited number of students.

Fifteen resident surgeons and physicians, who must be registered medical practitioners, are appointed by the managers of the Infirmary every six months, and fourteen non-resident surgeons and physicians are also appointed for the same period. Further appointments in special diseases are open to these resident and non-resident physicians and surgeons.

St. Mungo's College

The classes in St. Mungo's College (vide Glasgow Royal Infirmary) qualify for the medical and dental qualifications of the English, Scotch, and Irish Conjoint Boards, and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College. Further particulars can be obtained from the Secretary of the Medical Faculty.

Victoria Infirmary

This institution, situated at Langside, and having its office at 40, St. Vincent-place, Glasgow, has 477 beds, and is the third of the extensive general hospitals in Glasgow to afford opportunity for clinical instruction to students. In addition to a full general staff there is a clinical research laboratory with pathologists and bacteriologists attached; radiological instructor, and a full staff of specialists. The Bellahouston Dispensary, also with a clinical staff, is conducted in connexion with the Victoria Infirmary. The Paying Patients' Wing has been extended and now has accommodation for 80 patients.

Royal Hospital for Sick Children, Glasgow

This institution consists of: (1) a hospital at Yorkhill containing 275 cots, built on an elevated and central site close to the University; (2) an out-patient department in West Graham-street; and (3) a country branch at Drumchapel, Dumbartonshire, containing 80 cots. There are one professorship and four lectureships in the University of Glasgow in connexion with the hospital, one professorship and one lectureship on the medical diseases of infancy and childhood, one lectureship on surgery and orthopædics in relation to infancy and childhood, one lectureship on biochemistry in relation to infancy and childhood, and one research lectureship on the pathology of the diseases of infancy and childhood. The lectures are both systematic and clinical, but particularly and chiefly the latter. In addition, special facilities are given for post-graduate study. Resident house physicians and surgeons are appointed every six months, in April and October.

Glasgow Royal Maternity and Women's Hospital

The average number of patients in the hospital at Rottenrow is 164. There are also over 4000 mothers attended per annum in their own homes. The work of the antenatal wards with their 50 beds is supplemented by large antenatal clinics where over 5000 new patients are seen in the course of the year. Well-equipped research laboratories were opened in 1926. A full-time Director of Research has been appointed. A pædiatrician gives daily attendance and the practice of the hospital affords a good field for post-graduate study.

Glasgow Royal Samaritan Hospital for Women

The hospital has 160 beds and offers excellent facilities for clinical instruction in the diseases peculiar to women. A new Radiological Department with the most modern apparatus for treatment was recently opened. Lectures and clinical demonstrations are given by members of the surgical staff. There is a complete course each University term for University students and one course in the summer term for College students. A post-graduate course is held during the summer months and a series of demonstrations for general practitioners is carried out in the winter. The hospital is represented on the Board of the Glasgow Post-Graduate Medical Association formed for coördinating post-graduate medical teaching. The Royal Samaritan Lectureship in Gynæcology is a University Lectureship associated with the hospital.

Glasgow Lock Hospital

The hospital at 41, Rottenrow, Glasgow, founded in 1807, contains 84 beds and 16 cots for the treatment of females suffering from Venereal Diseases. There is also a Labour Ward, and a well-equipped Dispensary for out-patient attendances. There is a bacteriological laboratory, equipped with modern appliances, where continuous research work is done. Large University classes are held on the subject of female venereal disease. Post-graduate classes are also held. Recently the hospital has been completely renovated and modernised.

Glasgow Eye Infirmary

The wards and dispensary at Berkeley-street and Charlotte-street are recognised by the University for the purpose of instruction in ophthalmology for graduation in medicine at the University. A venereal centre has been established, and a branch dispensary has been opened in Clydebank. Post-graduate classes are held.

Glasgow Ear, Nose and Throat Hospital

The hospital contains 57 beds. At out-patient and indoor departments at 306, St. Vincent-street, clinical instruction is given. A research department has been installed and post-graduate courses are held during the year. Recognised by the University as a teaching school in Diseases of the Throat, Nose, and Ear.

Queen Margaret College*

Queen Margaret College (Women's Department of the University) is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curricula, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. The school of medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. The women students attend classes in the various University Buildings at Gilmorehill, the Royal Infirmary, the Western Infirmary, and the Victoria Infirmary. Facilities for clinical work are given in the Royal, Western, and Victoria Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine, and women are admitted to certain University bursaries and fellowships.

UNIVERSITY OF ST. ANDREWS

Four Degrees in Medicine and Surgery are conferred by the University of St. Andrews (United College, St. Andrews, and University College, Dundee)—viz., *M.B.*, *Ch.B.*, *M.D.*, *Ch.M.*, a Diploma in Public Health, Diploma in Dental Surgery (*L.D.S.*), and a Diploma in Public Dentistry (*D.P.D.*).

The extent and standard of the Preliminary Examination is determined by the Scottish Universities Entrance Board, constituted under Ordinance No. 70 of the Scottish University Courts (General No. 3—Regulations as to Admission to the Scottish Universities for purposes of graduation), in accordance with the terms of that Ordinance. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities exempts. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science.

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* No returns.

Dr. Robert Heilig Library
S. M. S. Medical College

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates must have been engaged in medical study for at least five years. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, including such examinations as may be prescribed in the various classes—viz., Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, Practice of Medicine, Surgery, Midwifery and the Diseases peculiar to Women and Infants, Pathology. Bacteriology, Practical Chemistry, Physics, Botany, Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere with not fewer than 80 patients, with a distinct staff of physicians and surgeons, and recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, *Children's Diseases, Fevers,* Ophthalmology, *Diseases* of the Ear, Throat, and Nose, Anæsthetics, Dermatology, Venereal Diseases, Tuberculosis, and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the *following regulations shall have effect: 1. Two of* the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine.

Part or whole of the medical curriculum of St. Andrews University must be taken at *University College, Dundee.* Provision is made by St. Andrews University for instruction in the work of the first two years, including Anatomy and Physiology, in both St. Andrews and Dundee. The last three years of the curriculum must be taken in Dundee in the medical school.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica, Pathology and Bacteriology, Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynæcology (Systematic and Clinical).

Dundee Royal Infirmary

This institution has 450 beds. In addition to the ordinary Medical and Surgical Wards, there are special departments for Midwifery (In- and Out-door), for Diseases of Women, of Children, of the Eye, of the Ear, Nose, and Throat, and of the Skin; and for Pathology, Radiology, Electrotherapeusis, and Electrocardiography. The Pathological Department has recently been reconstructed and enlarged. Clinical teaching is given to students by the Honorary Staff; post-mortem examinations are conducted by the Pathologist. All courses of instruction are recognised by the University of St. Andrews and the other Universities and Boards of the United Kingdom. Ten Resident Medical Officers are appointed every six months. Clinical clerks and dressers are attached to the Physicians and Surgeons, and Students are appointed as assistants in the pathological department. Post-graduate classes dealing with General Medicine and Surgery, Midwifery, and other Special branches are held in May and June.

Post-graduate courses are given in connexion with the Dundee Royal Infirmary during the spring and summer months.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS

CONJOINT EXAMINING BOARD

The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three bodies. This is the Scottish Conjoint Board. The three bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery.

The hospitals which are recognised by the Scottish Conjoint Board as places where professional study for their diplomas can be pursued are *all those institutions* which feed the medical faculties of the universities, as well as all the places which are recognised by the *English and Irish* Conjoint Boards.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, 1 term; Elementary Biology, 2 terms; Elementary Inorganic and Organic Chemistry, 2 terms; Anatomy Lectures, 2 terms; Practical Anatomy, 5 terms; Physiology Lectures, 2 terms; Practical Physiology (including Histology, Biochemistry, and Biophysics), 3 terms; Materia Medica and Practical Pharmacy, 2 terms; Pathology (including Practical Pathology), 3 terms; Practice of Medicine, 2 terms; Clinical Medicine, 3 terms; Principles and Practice of Surgery, 2 terms; Clinical Surgery, 3 terms; Midwifery and Gynæcology, 2 terms; Diseases of Children, 1 term; Medical Jurisprudence, 1 term; and Public Health, 1 term. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than nine months in the wards in each case, and receive practical instruction in administration of anæsthetics. He must attend for three months the practice of a public dispensary especially recognised by any of the above authorities, and three months' attendance *at* the out-patient department of a recognised general hospital. This attendance should be made after the student has passed the First and Second Examinations.

Candidates are also required to attend the following three-monthly courses: *Diseases and Injuries* of the Eye; Insanity; Infectious Diseases; Gynæcology; Tuberculosis; Diseases of the Skin; Diseases of the *Ear, Nose, and Throat*; Radiology; *Orthopædics*; Diseases of Children. The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Systematic and Practical Biology, Chemistry, and Physics.

The Second Examination must be Written, Practical, and Oral, and consist of the following subjects: (1) Anatomy and Embryology, and (2) Physiology, including Histology (if not included in Anatomy), Biochemistry, and Biophysics. Candidates may be admitted to this Examination on production of the necessary certificates of curriculum.

The *Third Examination* must be Written, Practical, and Oral, and consist of the following subjects: (1) Pathology, including Bacteriology and Morbid Anatomy, and (2) Pharmacology (Theoretical and Practical), in- [illegible] istry, the Principles of [illegible] Writing. Candidates [illegible] amination on production of the necessary certificates of curriculum.

The *Final Examination* must consist of the following subjects[1]: (1) Medicine, including Therapeutics, Applied Anatomy and Physiology, and Clinical Pathology with Practical Medicine; (2) Surgery, including applied Anatomy and Physiology, Clinical Pathology, with Practical Surgery; (3) Midwifery and Diseases of Women, Clinical Obstetrics and Gynæcology, with Practical Midwifery; and (4) Medical Jurisprudence and Public Health. Medicine, Surgery, and Midwifery must be taken together, and Medical Jurisprudence and Public Health, and not earlier than on the conclusion of five Winters and five Summers of Medical Study, provided that a period of 33 months has elapsed since passing the Second Professional Examination. The Schedule for the Final Examination must contain a summary of the entire Course of Study, and, properly attested or proved by Certificates, must be lodged with the Inspector, and the fee paid, not later than two weeks before the examination. At the same time there must be produced a Certificate to show that the Candidate is not less than 21 years of age. No Candidate can be exempted from examination on any subject of the Final Examination unless he has already passed in the subject at this Board.

In addition to the Written and Oral Examinations all Candidates must be subjected to Clinical Examinations in Medicine, Surgery, and Midwifery and Gynæcology, which shall include the Examination of Patients, Physical Diagnosis, the Clinical use of the Microscope and of other instruments, Clinical Chemistry, Surgical Appliances, Bandaging, Surface markings, Skiagrams, &c. The Oral Examination includes the recognition of specimens. All Candidates for the Final Examination must complete the three portions (Medicine, Surgery, and Midwifery) within a period of 19 months.

There are four periods of examination annually.

The Registrar in Edinburgh is Mr. David Thomson, 18, Nicolson-street; and the Registrar in Glasgow, Mr. David Willox, 242, St. Vincent-street, to whom fees and certificates must be sent for the respective examinations, and from whom particulars of fees can be obtained.

School of Medicine of the Royal Colleges, Edinburgh

The Lectures in this School qualify for graduation at Edinburgh and other Universities, for the Examinations of the Conjoint Boards of Edinburgh and Glasgow, London and Dublin. The number of students attending varies from year to year, and in recent years the average number has been about 600. In accordance with the Regulations of the University of Edinburgh one-half of the qualifying classes required for graduation there may be attended in this School, the fees paid for such classes being the same as those for the corresponding University classes. Special classes of instruction for
Dental students are conducted in the Scl
graduate courses are conducted in conju
the University. Further particulars re
School, also its calendar (price 9*d*., includi
may be had on application to the Dean of
Surgeons Hall, Edinburgh.

ROYAL COLLEGE OF PHYSICIA EDINBURGH

In addition to the Diplomas granted by
Conjoint Board, the Royal College of
grants its Single Licence to candidates w
are already on the Medical Register.

The Royal College of Physicians of
grants a *Membership* and a *Fellowship*.

Membership.—A candidate, who must
tiate of a British or Irish College of Phy
graduate in medicine of a University, a
the Council, and 24 years of age, is e
medicine, therapeutics, and in any bra
departments of medicine specially prof
as general pathology, psychology, pul
obstetrics, gynæcology, diseases of child
medicine, or medical jurisprudence.

Fellowship.—The Fellows are selecte
ranks of the *Members.*

ROYAL COLLEGE OF SURGEO EDINBURGH

The Royal College of Surgeons of
admits to the examination for its Single
candidates who hold a Diploma in Medi
British, Indian, or Foreign university
British College of Physicians, or of the
Apothecaries of London or Apothec
Dublin, granted under the provisions of
Act, 1886, whose preliminary examinatio
of professional study is proved to be
fulfil the requirements of the College,
who have passed a full examination for
above. Female practitioners are admi
Licence of the College and also to the Fell
the regulations apply to practitioners of e

The College grants a diploma of Fell
examination to the holders of British surg
or diplomas and the holders of recogn
of the Universities of Canada, Australi
Zealand.

The Fellowship.—Candidates must be
age and in practice for at least two
examination is written and viva voce, a
surgery and surgical anatomy, operati
and clinical practice. One optional su
also be taken, the range of these specialis
nearly every branch of medicine. Can
not allowed to appear for more than th
the examinations, unless by permission
dent's Council. Three weeks' notice
to appear for examination must be gi
candidate to the College.

ROYAL FACULTY OF PHYSICIAN SURGEONS OF GLASGOW

The Royal Faculty of Physicians and
Glasgow grants a Fellowship and a Li
held separately. The Licence is granted a
qualification to qualified practitioners
after examination in surgery, includi
anatomy and clinical surgery.

Fellowship.—The Fellowship of the
granted after examination in medicine
together with an optional subject, whi
anatomy or physiology, or be selected from
branch of medicine or surgery. Fou
notice must be given by the candidate to
In certain circumstances Fellows may b
a mark of distinction. Address of Reg
St. Vincent-street, Glasgow.

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[1] Candidates at the Final Examination may be examined on Diseases of Children, Fevers, Tuberculosis, Insanity, Skin Diseases, Diseases and Injuries of the Eye, Diseases of the Ear, Throat, and Nose, Radiology, Venereal Diseases, Orthopædics, Vaccination, and Anæsthetics.

MEDICAL EXAMINING BODIES AND SCHOOLS IN IRELAND

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC)

Matriculation.—University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary: Extern Students, any examination recognised by the General Medical Council.

Pre-registration Examination in Elementary Physics and Chemistry.—Before beginning the five years' Medical curriculum students must pass an examination in elementary Physics and Chemistry. This examination is held at the end of September, in January, in March, and in July. Courses in preparation for it may be taken in the School of Physic.

Degrees in Medicine (M.B.), Surgery (B.Ch.), and Midwifery (B.A.O.).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of registration. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended: (1) Botany, Zoology, Physics, and Chemistry; Descriptive and Applied Anatomy; Histology, Physiology and Applied Physiology; Pathology and Bacteriology; Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Practice of Medicine; Surgery; Midwifery and Gynæcology. (2) Three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital. (3) Practical Vaccination, one month's instruction. (4) Mental Disease, three months. (5) Practical Midwifery with Clinical Lectures, including Antenatal and Infant Hygiene Clinics, also not less than 20 personally conducted cases, five months, one of which must be as a resident intern student. (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. Intermediate Medical, Part I., including Anatomy and Physiology, Biochemistry and Histology; Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica and Therapeutics, Pathology and Bacteriology; and Part II., Medicine, including Clinical Medicine, Hygiene, Jurisprudence, and Mental Diseases; Surgery, including Operative and Ophthalmic Surgery; Midwifery and Gynæcology. Part I. may be passed in the fourth year, and Part II. completed at the end of the fifth.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A. of three years' standing. He must also submit a thesis and pass an Examination before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not less than three years' standing and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study, or study and practice, of his profession. He must then pass a special examination.

Master in Obstetric Science.— A Master in Obstetric Science must be a Bachelor in Obstetric Science of two years' standing, and must produce evidence of having been engaged in the study or practice of Obstetric Medicine and Surgery during two years. He is then required to pass a special examination.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at the Rotunda Hospital or other recognised institution, a six months' course in Trinity College, and then pass a special examination. The minimum time required for the complete course is nine months.

Bachelor in Dental Science and Master in Dental Science.—The regulations under which these degrees are awarded can be obtained by application to the Registrar of the School of Physic.

All Degrees and Courses of Instruction are open to women students.

Scholarships and Prizes.—1. Medical and Surgical Travelling Prizes, £100, awarded in alternate years. 2. Bicentenary Memorial Prize, £30, awarded yearly, and given to the Travelling Prizeman. 3. Sir John Banks Prize and Medal. 4. Edward Hallaran Bennett Prize and Medal. 5. FitzPatrick Scholarship, awarded on results of Final Examination (interest on £1000). 6. Medical Scholarship, £20 per annum for two years, awarded in Chemistry, Physics, Botany, and Zoology. 7. Medical Scholarship in Anatomy and Physiology, £20 per annum for two years. 8. Henry Hutchinson Stewart Scholarships, one in Botany, Zoology, Chemistry, and Physics, and another in Anatomy and Physiology, awarded annually and valued at £10 per annum for three years. 9. Henry Hutchinson Stewart Scholarship in Mental Diseases, awarded from time to time, £50 per annum for three years. 10. John Mallet Purser Medal, awarded annually in Physiology. 11. Daniel John Cunningham Medal and Prize, awarded annually in Anatomy. 12. Begley Studentship, £40 per annum for four years, awarded annually. 13. Kingsmill Jones Memorial Prize, awarded annually in Natural and Experimental Science, £15. 14. O'Sullivan Memorial Scholarship, £48, awarded annually for excellency of record in school. 15. Adrian Stokes Memorial Fellowship, awarded every second year, the holder to carry out original work in Pathology and Bacteriology, about £320. 16. Aquilla Smith Prize, awarded annually in the Final Medical Examination, Part I., about £10. 17. Walter G. Smith Prize, awarded annually in Materia Medica and Therapeutics, about £10. 18. De Renzy Centenary Prize in Public Health, awarded annually, £15. 19. Connolly Norman Medal in Mental Diseases.

Post-graduate Instruction.—Arrangements have been made, with the approval of the Board of Trinity College, for a post-graduate course of instruction at the School of Physic during the autumn from Monday, Sept. 16th, to Saturday, Oct. 5th. Women graduates can be accommodated at Trinity Hall.

NATIONAL UNIVERSITY OF IRELAND

Matriculation.—All students must pass a matriculation examination; the examination taking place in June and September in Dublin, and at certain local centres, includes five subjects, three of which must be Irish, English, and mathematics. All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination: (1) Irish. (2) Latin. (3) Greek. (4) French. (5) German. (6) Italian. (7) Spanish. (8) Portuguese. (9) Welsh, or any other modern language approved by the Senate. (10) English. (11) Mathematics. (12) History. (13) Geography. (14) Applied Mathematics, or Physics as an alternative. (15) Chemistry. (16) Botany. (17) Agricultural Science. (18) Commerce. (19) Music, and for women candidates only (20) Physiology and Hygiene. Students entering for degrees in Medicine or Dentistry, if not already registered by the General Medical Council, must take Irish, Latin, English, Mathematics, and a fifth subject.

The medical degrees granted are:—

M.B., B.Ch.; B.A.O.; M.D., M.Ch., M.A.O., Ph.D.—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, 49, Merrion-square, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

University College, Dublin

Matriculation.—Almost all the students of the College are matriculated students of the National University of Ireland. The pre-registration examination in physics and chemistry is taken after matriculation either at the beginning of or during the winter session. The course is of five years' duration and dates from the passing of the pre-registration examination.

Degrees of M.B., B.Ch., and B.A.O.—The First Examination includes Applied Physics, Applied Chemistry, Botany, Zoology, and Applied Biology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination (Part I.) includes Pathology, Materia Medica, Pharmacology, and Therapeutics. Part II. (Third Examination), taken at the end of the Fourth Winter Session, includes Hygiene and Medical Jurisprudence.

The Final Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year after registration, when the curriculum has been completed. The degree of M.D. may be obtained either by examination or on published work.

The D.P.H. Course extends over the year, beginning at the opening of the session.

University College, Cork

In the School of Medicine students must have passed the Matriculation Examination of the University or some other recognised examination, and a preliminary examination recognised by the General Medical Council.

Medical Students who have passed the First Professional Examination of the Conjoint Boards of Ireland, England, or Scotland may be admitted to the rank of second-year students on making application to the Council. Similarly, students who have passed the Second Professional Examination of the same Boards may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may rank as fourth-year.

The school is provided with physiological, toxicological, pathological, and pharmaceutical laboratories, materia medica, anatomical, and pathological museums, as well as a collection of surgical and obstetrical instruments and appliances. There are dissecting-rooms, well-appointed physical, chemical, and biological laboratories, a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings.

Clinical Instruction.—Students may attend the South Charitable Infirmary and County of Cork General Hospital, Cork North Charitable Infirmary and City of Cork General Hospital, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, Bon Secours, Fever, the District, and Ear, Eye, and Throat Hospitals. Candidates are prepared for D.P.H.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, and in respect of the hospitals from the Secretaries.

Residence of Students.—Students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, and register their addresses each session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students. There are Students' Clubs for men and women students of the College and various athletic clubs.

University College, Galway

The College contains a well-lighted and ventilated dissecting room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynæcological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. In the School of Medicine there are 12 Entrance Scholarships, varying in value from £30 to £60 each, for which Medical Students compete with other students on the Entrance Course. In the Second, Third, and Fourth years three Scholarships in each year, value from £30 to £40 each, are reserved for Medical Students. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies in the College, including a Biological and Medical Society. There are facilities for research and Post-graduate work in the Chemistry, Physiology, Pathology, and Anatomy departments. There are ample facilities for Women Students.

Clinical Instruction is given in the Galway Central Hospital and in the Galway Tuberculosis and Fever Hospitals. The CENTRAL HOSPITAL (300 beds) is completely renovated. In addition to the surgical and medical departments, there are now eye and ear, throat and nose, gynæcological and obstetrical, pathological, X ray, electrical and massage departments. Medical and Surgical Clinics are held on alternate days during term. Two Resident Physicians and two Resident Surgeons are appointed every six months. Resident Students are admitted. The hospital is open to qualified medical men for post-graduate work.

HOSPITALS AFFORDING RECOGNISED PRACTICE [1]

The following hospitals afford practice recognised by the Irish Universities and Corporation. Further information can be obtained from the respective secretaries.

Sir Patrick Dun's Hospital

Classes both in Medicine and Surgery are held each morning at Grand Canal-street, Dublin, from 9 o'clock from the beginning of October till the end of June. Special classes for junior students will be held in the wards during the months of October, November, and December. A resident surgeon and resident physician, with salaries, are appointed annually. Six resident pupils are appointed every six months. Twelve surgical dressers and twelve clinical clerks are appointed each month. There are facilities for women students.

The practice of the hospital is open to all students, and the certificates are recognised by Dublin University, the National University, and Royal Colleges of Surgeons of England; Ireland, and Scotland. It is an official "Treatment Centre" for venereal diseases.

At the end of last year an out-patient department was fully equipped. It has medical, surgical, gynæcological, ear, nose and throat departments, and an accident department, with theatre and dressing dispensary. A valuable asset to the teaching responsibilities of the institution has thus been added.

Prizes and Medals.—Clinical medals and prizes amounting to about £21 each will be awarded in medicine and in surgery respectively in accordance with the will of the late Rev. Samuel Haughton, M.D., S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in medicine and surgery provided they show sufficient merit.

Adelaide Hospital

Two resident surgeons and four or more resident pupils are elected every six months.

Prizes.—The Hudson Scholarship, £30 and a Gold Medal, as well as the Hudson Prize, £10 and a Silver Medal, are awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology. In addition to this prizes are awarded in gynæcology and dermatology, and in clinical medicine and surgery for junior students. Wallace Beatty Memorial Bursaries are granted at the discretion of the Medical Board at the beginning of the Winter session. The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. Post-graduate work in the hospital is in conjunction with the course in Trinity College.

Mater Misericordiæ Hospital

This hospital, under the care of the Sisters of Mercy, containing 300 beds and 96 private beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given by the staff. Ophthalmic surgery and surgery of the nose and throat are taught in the special wards and in the dispensary. Surgical operations are performed daily. Connected with the hospital are extensive dispensaries, which afford valuable opportunities for the study of general medical, dermatological, surgical diseases, and accidents: a fully equipped biochemical laboratory, a modern electro-massage department, an electrocardiograph room, and radiological department. Instruction is given on pathology and bacteriology. Four house physicians, eight house surgeons, and 18 resident pupils are elected annually. Dressers and Clinical clerks are appointed regularly and certificates given for merit. Leonard Prizes will be offered for competition annually. Certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. There is a private hospital for the reception of medical and surgical cases. A training school and a home for trained nurses are connected with the hospital, and nurses who have passed a qualifying examination can be obtained on application to the Lady Superioress. Entries can be made with any of the physicians or surgeons or with the Registrar, 8, Fitzwilliam-place, Dublin.

Mercer's Hospital

This hospital, situated in the centre of the city of Dublin, is in closest proximity to the Medical Schools, any of which can be reached on foot within five minutes, and from its position receives a large number of cases of emergency surgery in addition to the ordinary medical and surgical practice. Extensive alterations and reconstruction have brought the wards up to date. Additions have been made in the radiographic and electrocardiographic departments. Classes for pupils are held on alternate mornings in the medical and surgical wards. There is a large out-patient department available for the teaching of medicine, surgery, and gynæcology. Arrangements for clinical instruction are made with Cork-street Fever Hospital. A gold medal is awarded annually to the best pupil on the books of the hospital, and an annual prize of £25 has been added. A house surgeon and a house physician are appointed annually, and there is residential accommodation for six men and two women pupils. Clinical clerks and dressers are appointed from the classes.

Richmond, Whitworth, and Hardwicke Hospitals *

These House of Industry hospitals, North Brunswick-street, Dublin, contain 325 beds—140 for surgical cases, 75 for medical cases, 78 for fever and other epidemic diseases, and an auxiliary wing with 32 beds, devoted mainly to throat, nose and ear, and skin diseases. Three resident physicians and three resident surgeons are appointed each half year. Resident clinical clerks are appointed each quarter, and it has always been the aim of the Medical Board to ensure that each student spends at least six months in residence. In addition, junior students are appointed as extern clinical clerks and surgical dressers. Women students are eligible on the same terms as men. Ample facilities exist for post-graduate work in the various special departments, as well as in general medicine and surgery. Extensive alterations and improvements have recently been made in the X ray, electrotherapeutic, and electrocardiographic departments. Two open-air huts to accommodate ten patients have been erected in the spacious Whitworth grounds. A new students' residency has been opened. This contains facilities for 20 male and 8 female resident students.

Royal City of Dublin Hospital

The hospital contains 160 beds and a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. There is a large nursery where special opportunities are afforded for the study of diseases of children, both medical and surgical. There are also special wards for ophthalmic, aural, and gynæcological cases; also a department for the Erlangen Treatment by deep therapy. There is a largely attended out-patient department, where students are allowed to attend accidents and dress cases under supervision. Six resident pupils are appointed every three months. A house surgeon and a house physician are appointed annually.

Dr. Steevens' Hospital

This hospital, at Dublin (Kingsbridge), contains 180 beds. There is accommodation for 10 resident pupils, each of whom is provided with a separate bedroom, and board is supplied by the hospital at a reasonable rate. There is an electric massage department, a "sun-ray" and diathermy department, and an X ray department. There are also two V.D. wards and a largely attended V.D. treatment centre, as well as a large ward reconstructed and re-equipped and opened as open-air ward for tuberculous and other diseases of bone (25 beds) for females, two open-air verandahs for male surgical tubercular cases (14 beds), and children's ward (12 cots). Information as to terms for residency can be had from the Resident Surgeon at the Hospital.

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[1] This list of the institutions recognised by the Conjoint Board of Ireland is supplemented in the regulations of the Colleges by those hospitals mentioned as recognised institutions in Scotland and England. The recognised facilities for clinical instruction in some of the Irish centres have been described. The secretaries of the hospitals will always be ready to answer inquiries or to give additional information.

* No returns.

Meath Hospital and County Dublin Infirmary

The hospital contains 150 beds, available for clinical teaching, both medical and surgical. There is a separate fever block which contains 40 beds. A special ward has been set apart for the reception of children. Special departments are as follows: Ear, Nose, and Throat, Dental, Diseases of Women, Skin, and Genito-urinary System. Clinical Teaching includes classes for both Senior and Junior Students. The Joseph Smyth Scholarship in Medicine, value £50, is awarded biannually. Gold and Silver Medals are given annually to the best answers in an examination in Clinical Medicine and Surgery. Prizes are also awarded to the Junior classes at the Sessional Examination. Two House Surgeons, a Resident Casualty Officer, and a House Physician are selected each half-year from fully qualified pupils of the hospital. A new students' quarters has recently been erected. The Meath Hospital is within a few minutes' walk of the University of Dublin, the Royal College of Surgeons, and The National University.

Jervis-street Hospital, Dublin *

This hospital contains 120 beds. Eight resident medical officers are appointed each year and facility is thus given to past students of the hospital to acquire experience as house surgeons. Resident students are provided with apartments, fuel, and light, free of charge. Arrangements have been made by which students of the hospital can have special fever training in Cork-street Fever Hospital, free of charge.

St. Vincent's Hospital and Dispensary

This hospital has 200 beds. Clinical lectures in medicine and surgery are held from October to June. Special classes for juniors from October to December. Pathological and bacteriological demonstrations are given every Thursday, and instructions in the use of laryngoscope and otoscope for senior students every Saturday. Medals and Prizes: the Bellingham gold medal in Medicine and the O'Ferrall gold medal in Surgery are offered for competition at the end of the summer session, as well as junior prizes, also the McArdle Memorial Prize, value £20. There are a large extern department and a new pathological laboratory. A new electrocardiographic department has been installed.

Rotunda Hospital

The Rotunda Hospital, Dublin, is the largest combined gynæcological and maternity hospital in the British Empire. Over 4000 confinements are attended annually, and upwards of 1000 gynæcological patients admitted. Students can take out their necessary gynæcological and midwifery practical courses. The work of the hospital is carried on continuously through the year, and consists of daily clinical instruction in the maternity department, and examination and operations in the gynæcological department. Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical. They also assist in rotation at gynæcological operations, and if staying more than two months are personally allowed to perform some minor ones. An antenatal dispensary is held three times weekly and all students are encouraged to attend. A special class in gynæcological examination and diagnosis is conducted by the Assistants to the Master. In addition there is a special class in operative obstetrics, limited in number. The pathological laboratory is under the supervision of a skilled pathologist, who gives special classes at intervals. A Biochemist has just been appointed who is carrying out the Aschheim-Zondek test for pregnancy, and who is prepared to help any Post-graduates who are keen on doing research work on the material in the hospital. There is a fully equipped X ray installation under the care of a competent radiologist. A ward has been opened for the treatment of infantile conditions, and is under the care of a pædiatrician, who gives instruction in the out-patient department, which is held daily. The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L.M., and consist of Extern Assistants for six months, one being appointed every three months. From these the Assistants to the Master are appointed. Women students can reside in the hospital on the same terms as men. Board and residence can be obtained in the hospital. One grass and two hard tennis courts and one standard squash racquet court are available for students in the residents' mess. The L.M. certificate is given to qualified practitioners on examination after six months' attendance at the hospital (four months in the case of those who took their midwifery training in the hospital). Fees: one month, £6 6s.; months other than first, £4 4s.; three months, £12 12s. L.M. course £21. Full particulars from Andrew H. Davidson, M.D., Master, Rotunda Hospital.

Coombe Lying-in Hospital

The Coombe Lying-in Hospital and Guinness Dispensary for the Treatment of Diseases peculiar to Women, Dublin, contains 70 beds, and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. The hospital gives to men and women students and post-graduates a thorough training in obstetrics and gynæcology. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a large general dispensary, held daily, at which instruction is given on the diseases of women and children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this dispensary, or at the prenatal clinic, held on three evenings a week, at which there are about 3000 attendances annually. Every year about 1200 women are delivered in the hospital and about 1500 on the district. There is accommodation for intern pupils, who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Women students can reside in the hospital. Clinical assistants are appointed from amongst the post-graduates as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Students can attend at any time. Plans for a new hospital of 136 beds, and a new residency for students, are now complete, and the building operations will begin in the near future.

National Maternity Hospital

This hospital at Holles-street, Dublin, is now in full working order. It has 80 beds and comprises intern and extern maternity, gynæcological wards, and a dispensary for the treatment of diseases of women, an infant clinic, and an antenatal and postnatal branch. The postnatal instruction is given three times a week. Every facility is given for the carrying out of practical work, and modern equipment provides full facility for the treatment of both maternity and gynæcological patients. Undergraduate and post-graduate courses are arranged at any time and clinical instruction is given daily and oral lectures four times a week. Certificates of attendance at this hospital are recognised by all the licensing bodies. The L.M. Diploma is given by special examination, which is held four times a year. Total number of admissions last year 1882. The building of a final section of the hospital, containing 64 additional beds and a new out-patient department, is about to be begun.

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* No returns.

QUEEN'S UNIVERSITY OF BELFAST

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.). The University also grants a Diploma in Public Health and a Diploma in Psychological Medicine, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission shall matriculate or fulfil such other test of fitness as may be prescribed by the Senate, or may be exempted from the matriculation examination by having passed similar examinations elsewhere.

For information as to Scholarships and Prizes, inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany, and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology, and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical Examination may present themselves for Part I. of this examination at the close of the third year, and for Part II. at the end of the Winter Session of the fourth year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the Second Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery and Gynæcology; (4) Ophthalmology and Otology. Candidates who have previously passed the Third Examination may present themselves for the Fourth Examination at the close of the fifth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination and on the clinical courses in the hospitals. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has passed in the subjects of Part I. of the Third Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The J. C. White laboratories are fully equipped for research in biochemistry. The Institute of Pathology, which is adjacent to the Royal Victoria, Royal Maternity, and Children's Hospital, provides fully equipped accommodation for Pathology and Bacteriology, including class-rooms, demonstration room, lecture theatre, library museum, and research laboratories. There is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the Corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, and the diagnosis of cases of infectious diseases. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in the compounding and dispensing of medicines.

Clinical Instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Belfast Hospital for Sick Children, the Royal Maternity Infirmary and Hospital, the Ulster Hospital for Women and Children (56 beds), the Benn Ulster Eye, Ear, and Throat Hospital (30 beds), the Belfast Ophthalmic Hospital (30 beds), the City Fever Hospital, Purdysburn (360 beds), the Union Fever Hospital (200 beds), and the Belfast District Lunatic Asylum, where the Purdysburn Villa Colony has 1350 beds.

Further information can be obtained from the respective Secretaries.

Royal Victoria Hospital, Belfast

There are 430 beds. Students eligible for McGrath, McQuitty, Malcolm, Coutler Smyth, and Elwood Scholarships aggregate annual value £185. Twelve house surgeons and house physicians. Thirty-six resident pupilships, three months each, annually for senior students, of which a proportion is allotted to women students, special departments for radiology, clinical pathology, V.D., dermatology, gynæcology, [illegible] maternity, vaccine therapy, [illegible] dentistry, radium therapy. [illegible] and demonstrations are given on Wednesdays throughout the year with the exception of holiday seasons.

Mater Infirmorum Hospital, Belfast

This hospital contains 270 beds and is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given daily by Physicians and Surgeons. Surgical operations are performed daily. The out-patient departments in medicine and surgery, also the special dispensaries for gynæcology, ear, eye, and throat, electrotherapeutics, venereal diseases, varicose veins, and hæmorrhoids are very largely attended and afford valuable opportunities to students for the study of those subjects. There is a well-equipped electro-medical and massage department. A new extern has been erected beside the hospital on ground given by the Government of Northern Ireland. This will relieve the congestion of the old extern which in part is being converted into accommodation for resident students. A fine and extensive nurses' home has also been built in the vicinity of the hospital. There is also a dental dispensary. A house physician and two house surgeons are elected every six months. Resident pupils are admitted as the vacancies arise. Three Exhibitions and a Gold Medal are competed for annually in June. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom.

Belfast Hospital for Sick Children

At the hospital on Falls Road there are 75 beds, and clinical instruction is given. During the winter and summer sessions courses of lectures are delivered on the medical and surgical diseases incidental to infancy and childhood. Demonstrations in ophthalmology and pathology are given, and ample opportunities are afforded in the wards and in the out-patient department for gaining a practical and theoretical knowledge of the diseases of infancy and childhood. A department for conservative dentistry for small children has recently been equipped and is now in use. This hospital grants Certificates in Diseases of Children, which are recognised by the various examining bodies. Certificates are also granted for post-graduate study. A Gold Medal is offered for competition at the close of the session. A Davis Scholarship is awarded every two years for the best thesis on some branch of children's diseases.

Belfast Infirmary and Hospital

There are 1800 beds. Clinical courses are given quarterly, and a course for D.P.H. in hospital. An intern venereal clinic in infirmary is under the Corporation scheme. The maternity wards are recognised for practical midwifery training. The certificates of the vaccination class are recognised by the Local Government Board. There is a department for cancer with 32 beds, also X ray, bacteriological, and massage departments.

Royal Maternity Hospital, Belfast

This new building is in the grounds of the Royal Victoria Hospital and supersedes the maternity hospital in Townsend-street. There are 100 beds and an antenatal department catering for a large district. There is also an infant clinic and a separate septic block. The University obstetric tutor resides in the hospital and acts as senior resident medical officer. There are three house surgeons in addition, and resident accommodation for 15 resident students or post-graduates.

WE take this opportunity of thanking the officials of Government Departments and the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS

CONJOINT EXAMINING BOARD

The Conjoint Board of the Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland requires of candidates the passage either of its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council as well as passing in the Pre-Registration Examinations in Chemistry and Physics and Biology.

Professional Examinations.—There are three professional examinations, the first of which cannot be completed earlier than the end of the second winter session, nor the final before the conclusion of full five years of medical study. Before being admitted to any of them the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad. The first examination consists of Part I. (*a*) Biology, (*b*) Applied Chemistry and Physics; Part II., Anatomy and Physiology. The second examination deals with (*a*) Pathology, (*b*) Materia Medica, Pharmacy, and Therapeutics, (*c*) Forensic Medicine, Hygiene, and Public Health, (*d*) Ophthalmology, and may be taken separately.

Final Examination.—This is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the Pre-Registration Examinations, and five years at least since the beginning of the curriculum. The divisions are (*a*) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (*b*) Surgery, including Operative Surgery; (*c*) Midwifery, including Diseases of Women and Children, and the Practice of Vaccination.

Diploma in Psychological Medicine.—There are two examinations in connexion with this Diploma: Part I. consists of (*a*) Anatomy and Physiology of the Nervous System; (*b*) Psychology. Part II.: (*a*) Neurology, including Clinical and Pathological Neurology; (*b*) Psychological Medicine, including its legal relationships.

Further information can be obtained from the Secretary of the Committee of Management, Royal College of Surgeons, St. Stephen's Green.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The College issues its Licences in Medicine and in Midwifery to Medical Men whose names appear on the Registers of the General Medical Council or of Saorstat Eireann.

The Licence in Medicine.—The subjects of examination are: Practice of Medicine, Clinical Medicine, Pathology, Medical Jurisprudence, Midwifery, Hygiene, and Therapeutics.

The Licence in Midwifery.—Candidates must produce certificates of registration. A registered medical practitioner of five years' standing may be exempted from the examination by printed questions.

The Membership.—Examinations for Membership are held in February, June, and November.

The Fellowship.—Fellows are elected by ballot. An applicant must have been a Member of the College for at least one year and must have attained the age of 27 years.

Further particulars can be obtained from the Registrar of the Royal College of Physicians of Ireland, 6, Kildare-street, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND

The College issues its *Licence in Surgery* to practitioners whose names are entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he *presents himself for examination*, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Irish Conjoint Board.

Candidates are examined in General Surgery (paper and oral), Clinical Surgery, Surgical Pathology (oral), Operative Surgery, Surgical Anatomy (paper), and Ophthalmic and Aural Surgery (clinical).

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the *Final Examination* immediately after passing the *Primary part, provided they* have complied with the necessary regulations. The subjects for the Primary Examination are (*a*) Anatomy, including Dissections; and (*b*) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical *Anatomy and Pathology. For admission to the Final* Examination the candidate must have passed the *Primary Examination, and must* be a Licentiate or Graduate in Surgery of a university or licensing body *recognised* by the General Medical Council; all such candidates must not be less than 25 years of age.

Further particulars can be obtained from the Registrar of the College, Stephen's Green West, Dublin.

Schools of Surgery

The Schools of Surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century. They *are carried* on within the College buildings and are specially subject to the supervision and control of the Council, who are empowered to appoint and remove the professors and to regulate the methods of teaching pursued. The buildings have been reconstructed, the capacity of the dissecting-room nearly trebled, and special pathological and bacteriological laboratories are fitted with the most approved appliances in order that students *may* have the advantage of the most modern methods of instruction. Winter Session commences in October; Summer Session in April. Scholarships and Prizes: Carmichael Scholarship, £15; Mayne Scholarship, £8; Stoney Memorial gold medal; Operative Surgery, gold and silver medals; Barker Prize, £26 5*s.*; H. Macnaughton-Jones gold medal in Obstetrics and Gynæcology; and class prizes and medals. *Prospectus and guide for medical students* can be obtained post free on written application to the Registrar, Royal College of Surgeons, Stephen's Green W., Dublin.

APOTHECARIES' HALL OF IRELAND

The Licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the *necessary* examinations. The diploma of the Hall entitles the holder to be registered as a practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's Licence.

Candidates must pass three Professional Examinations, called the First and Second Professional Examinations and the Final Examination, which are conducted at separate times, partly in writing and partly practically and orally. The Examinations are held thrice a year—viz., in March, June, and November, or such other dates as may be determined.

Candidates who produce satisfactory evidence of having passed an examination for a Degree or Licence in Medicine, *conducted by* any University or Royal College in the British Empire, or by any Foreign University whose Degrees are recognised in the Foreign List of the Medical Register, will be exempted from the *Primary Examination.*

The subjects for the First Professional Examination are: Anatomy, Physiology and Histology, *including* Biochemistry; and for the Second Professional, *Materia* Medica and Pharmacy, Pathology, and Medical Jurisprudence and Hygiene.

For the Final Examination the subjects are: (*a*) Medicine and Clinical Medicine and Clinical Methods. (*b*) Surgery—Clinical, Ophthalmic, and Operative; and Surgical Anatomy. (*c*) Midwifery and Gynæcology, and Practical Pharmacy and Materia Medica (*if not taken at Intermediate Examination*).

Each candidate before receiving his diploma must *produce evidence* that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied by the Registrar at 95, Merrion-square, Dublin.

PRISON MEDICAL SERVICE

CANDIDATES for the Prison Medical Service are approved by the Secretary of State for the Home Department on the recommendation of the Prison Commissioners. Preference is always given to candidates who have experience of lunacy. Application for employment *may* be *made on a special* form, which can be obtained from the Secretary, Prison Commission, Home Office, London, S.W. In the smaller prisons the medical officership is part-time, and is usually *filled* by *practitioners* in the locality, preference being given to those who have special experience of lunacy. In the large prisons the medical staff must devote their whole time to the Service. In the case *of a whole-time service*, the appointment is in the first instance to the post of Medical Officer, Class II., and from this rank the Medical Officers, Class I., are selected as vacancies *occur*. The pay of the whole-time prison medical *staff is as* follows: Medical Officer Class II., £515 18*s.* a year, proceeding by annual increments to £738 12*s.* a year, the maximum being normally attainable after 10 years' approved service; Medical Officer, Class I., £797 3*s.* *a* year, proceeding by annual increments to £953 13*s.* a year, the maximum being normally attainable after 6 years' approved service. *Unfurnished quarters* are provided or an *allowance* in lieu is made. The *conditions of* service are liable to review. Study-leave is granted annually to two of the whole-time Medical Officers. There are 12 full-time medical officers of Class I. and 15 *Class* II. and 25 *part-time* medical officers. The *full-time posts* are pensionable. The number of vacancies is never large.

PHARMACEUTICAL SOCIETY

THE COLLEGE OF THE PHARMACEUTICAL SOCIETY is a constituent part of the University of London. The Society conducts *examinations* for registration as (*a*) Chemist and Druggist and (*b*) Pharmaceutical Chemist. Courses of Instruction are given for these examinations.

An Intercollegiate two years' course for the Final Examination for the degree of B.Pharm. of the University of London is also given. Medical students are admitted to the lectures and laboratory work. Certificates of instruction in the School are received by the Conjoint Board of the Royal Colleges and by the University of London. Graduates of approved Universities may carry out the research work necessary for the thesis for the Ph.D. of the University of London in the Society's Research Laboratories; this degree may be taken in Pharmacy, Pharmacognosy, Pharmaceutical Chemistry, *and* Pharmacology. Several scholarships are also offered. Further information may be obtained from the Dean, 17, Bloomsbury-square, London.

THE LANCET

LONDON: SATURDAY, AUGUST 31, 1935

REFORM OF THE CURRICULUM

A CONSPECTUS of the courses in medical education which present themselves to the student at the various universities and colleges before a medical degree or diploma can be obtained is published in these columns every year; and every year the Students' Number of THE LANCET is on the surface much like its predecessor, as on the surface it may resemble its successor. But the progressive nature of the educational curriculum can be grasped in a moment if issues which have appeared at considerable intervals are looked at with the comparing eye, and it is likely that in the near future there will be changes to record, whose effect will be immediately perceived. But, judging by the past, such changes may take place before their results appear in any conspectus.

For several years, and latterly with increasing attention, the medical curriculum has been closely examined by persons with proper equipment and authority to report upon it. In 1933 the General Medical Council adopted some wise recommendations in regard to professional examinations in response to a generally expressed opinion from many of the educational centres that the absence of due continuity and sequence in medical study caused the results of examinations to give an unfair view of the work of the candidates. In the same year the Council of the British Medical Association appointed a committee on Medical Education with the reference to consider and report upon the pre-medical studies; the content of the curriculum and its arrangements; the nature of examinations or other tests to be satisfied; and lastly on the question whether post-graduate educational experience should be required prior to registration. This was a valuable report, contemplating no stereotyped system of medical education but seeking to raise the scientific status and educational equipment of entrants to the profession. The course designed was coördinated so as to avoid separate blocks of study, and a feature of the scheme was the insistence on a period of practical work after the main part of the final examination had been passed, before full licence to practise was granted. There was no suggestion for lengthening the curriculum.[1] Next, in the spring of this year there appeared the report, the result of a joint conference between representatives of the universities of London, Oxford, and Cambridge, of the English Royal Colleges, and of the Society of Apothecaries, and in many directions the same conclusions were arrived at. The conference recommended no changes which would prolong the present minimum period of five years' study before a medical qualification could be obtained and aimed at methods which would make of the road to qualification a continuous period of study as little broken up by examinations as possible, thus affording the students more time and opportunity for self-education. The conference was impressed by the high proportion of failures in examinations in anatomy and physiology, but it looked to alterations in modes of teaching rather than to any lowering of the standard to mitigate this trouble. In respect of post-graduate clinical experience the conference held that a medical student after passing the final examination should spend at least six months as a resident medical officer in an approved hospital before entering upon private practice, and thought that in the near future a sufficient number of posts for the purpose would be available.[2] Thirdly, in June of this year there appeared the report of the Special Committee of the General Medical Council on the revision of the medical curriculum. This was an admirably clear analysis of the existing course, agreeing with the main recommendations which had already been expressed not only in the two reports alluded to above, but, and with reiteration, in the columns of the *British Medical Journal* and *The Lancet.* The document confirmed the accuracy of much of the criticism, but included the cheering expression that by comparison with the standards of qualification prevailing in other countries the British system was good, while its development could be best advanced by reshaping it. Admitting that the General Medical Council has no power to make any requirements subsequent to the passing of qualifying examinations, the report of the Council registered the opinion that there were no grounds for lengthening the present period of the curriculum.[3]

All three reports are the outcome of a general impression, to which frequent voice has been given, that the curriculm requires reshaping, as is allowed in the report of the G.M.C. The student is compelled to acquire for examination purposes matter that is of little practical service to him—while we allow that all knowledge has value; the thread of continuity is not sufficiently maintained between the preclinical and clinical instruction; the multiplicity of examinations consequently bears hardly upon the student, while as the standard of preliminary education, speaking generally, is not high, for many students the tests become unduly difficult. The three reports have appeared in substance in the medical press so that there is now a perfect opportunity of understanding the situation and what experts think of it. The issue remains with the G.M.C., the standardising authority, which, though it has the responsibility of control and supervision, respects always the autonomy of the qualifying bodies. It would seem that it is at the beginning and at the end of the course that the real changes may be expected, though action must be influenced by the necessity for obtaining the common consent of the different centres concerned; and this may be a delicate matter when the standard of preliminary education is at issue. Registration of medical students is not mentioned in any of the Medical Acts and we understand can only be enforced by the G.M.C. if Parliamentary power or general consent of the qualifying bodies is obtained; yet for many reasons registration should be made compulsory. At the end of the curriculum the student having passed the necessary tests for admission to the Register should be given more opportunity to acquire practical knowledge. This is stated or implied in all the reports but there is no recommendation dealing expressly with the matter which is common to them all. As a corollary we publish this week the results of a limited investigation into the material prospects of certain newly qualified persons. The wish is to give a picture of how a group of entrants belonging to an early period of qualification have been able to use their training, as now given, to make good in the world. The results of the investigation thus have a pertinent bearing on any reforms in the curriculum now contemplated.

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[1] Brit. Med. Jour., Suppt., 1934, i., 192.

[2] THE LANCET, 1935, i., 1161, and 1185–88.

[3] Ibid., 1935, i., 1393, and 1403–07.

SPECIAL ARTICLES

THE PRESENT-DAY OPENINGS OF MEDICAL PRACTICE

"Good heavens, gentlemen, what is to become of you all?" was Mr. Abernethy's remark a hundred years ago to the students of St. Bartholomew's Hospital on the first day of a new session. And last month in his presidential address to the national health insurance section at the Royal Sanitary Institute health congress at Bournemouth, Mr. F. J. Webb pointed out the difficulties facing the present-day graduate in medicine. Competition, he said, was being steadily increased from two sources—namely, the overcrowding of the profession by the large number of students annually qualifying, and, secondly, the encroachment of the public health services upon the territory of the family doctor through municipal hospitals, infant welfare centres, and tuberculosis clinics. The latter influence, however hardly it may bear upon the general practitioner, does not, of course, necessarily reduce the graduate's prospects of employment; it may merely shift its centre of gravity. In his promoter's address [1] to Edinburgh medical graduates, delivered about the same time, Prof. R. W. Johnstone also expressed some anxiety about the increasing number of medical students and the greater number of graduates likely to come upon the Register in the next few years. Our export trade, he reminded his hearers, is not what it was; the Dominions are producing doctors of their own in increasing numbers ("not Scottish doctors, it is true, but still doctors"). But he was confident that the so-called law of supply and demand would rectify matters, although too keen competition might introduce into professional life a commercial spirit destructive of its best traditions. The first five years of practice would almost certainly be lean years financially; but, as his old chief used to say to him, there is nothing makes a man work like an empty stomach.

Prof. Johnstone pointed his remarks by giving an account of an inquiry he had made into the careers of Edinburgh graduates who had been at least 25 years in practice. His information was derived largely from the Medical Directory. Of 1445 men and women whose record he analysed he regarded 3 per cent. as having achieved distinguished success, 31 per cent. considerable success, and 55 per cent. a fair degree of success—refusing however to give away the basis of his classification. Of these 1445 men and women about 80 per cent. went into general practice, 13 per cent. into the regular imperial services (Army two-thirds), and just over 6 per cent. became whole-time medical officers (62 M.O.H.'s, 30 asylum superintendents). The proportion taking higher degrees since graduation were in percentages: M.D., 30; one or more of the higher diplomas, 26; fellowships of the royal colleges, 16. Of the 100 women 60 had married.

With such problems as these in mind it appeared to the Editor of THE LANCET that it would be of considerable value and interest to prospective candidates for a medical degree, if a special inquiry were made into the experience of a large sample of medical men and women who had graduated in a more recent year. For this purpose the graduates of 1930 were selected, and approached by means of a questionnaire.

METHOD OF INVESTIGATION

In the year 1930, 1490 men and women registered their names with the General Medical Council. Of this total it was found possible to identify 1477 in the Medical Register of 1935, and to each of these the questionnaire here reproduced (the entries, of course, are imaginary) was directed.

This questionnaire was sent out in the middle of June and the replies received up to the middle of August have been included in the analysis discussed in the succeeding sections. It must be noted that of these 1477 graduates there were 1163 resident (according to their registered addresses) in Great Britain and the Irish Free State, and 314 who had migrated (or returned) to other parts of the world—142 to India, 39 to South Africa, 31 to Australia and New Zealand, 15 to Canada, and the remainder in twos or threes to countries spread throughout the world. The time interval which had to be allowed between dispatch of the questionnaire and the analysis of the replies was insufficient to allow all the possible replies to be received from abroad, although actually nearly 100 replies bearing foreign or colonial stamps were received.

THE RESPONSE

The total number of replies (excluding 39 returned "present address unknown") amounted to 651, or 44 per cent. of the maximum. A response of nearly one-half must be regarded with satisfaction, since many inquiries by questionnaire fail to secure replies from more than 10 per cent. of those addressed. This relatively large response is without doubt due to two factors—namely, the exclusion of any clue to the identity of the correspondent and the careful simplification of the queries included on the form. Whether the 44 per cent. of the graduates who replied may fairly be regarded as a representative sample of the total addressed is an important question, but one to which it is impossible to give a certain answer. There might well be a tendency for those who have been successful in their profession to be more eager to register their success than those who have failed. Alternatively, the latter might under the veil of secrecy be glad of the opportunity (as appears in a few cases) of stating frankly the drawbacks of the profession they have, perhaps misguidedly, chosen, though those who have turned to other professions might tend not to reply. It is out of the question to determine whether indeed there are any such factors of importance influencing the determination to answer or not to answer. The difficulty is inherent in all investigations of this type, and the only conclusion is that a large sample of replies has been received, that there is no obvious or certain reason to lead one to believe that this sample is unrepresentative of the total, but, equally, there is no evidence that it *is* representative. With this proviso we pass to the analysis of the replies.

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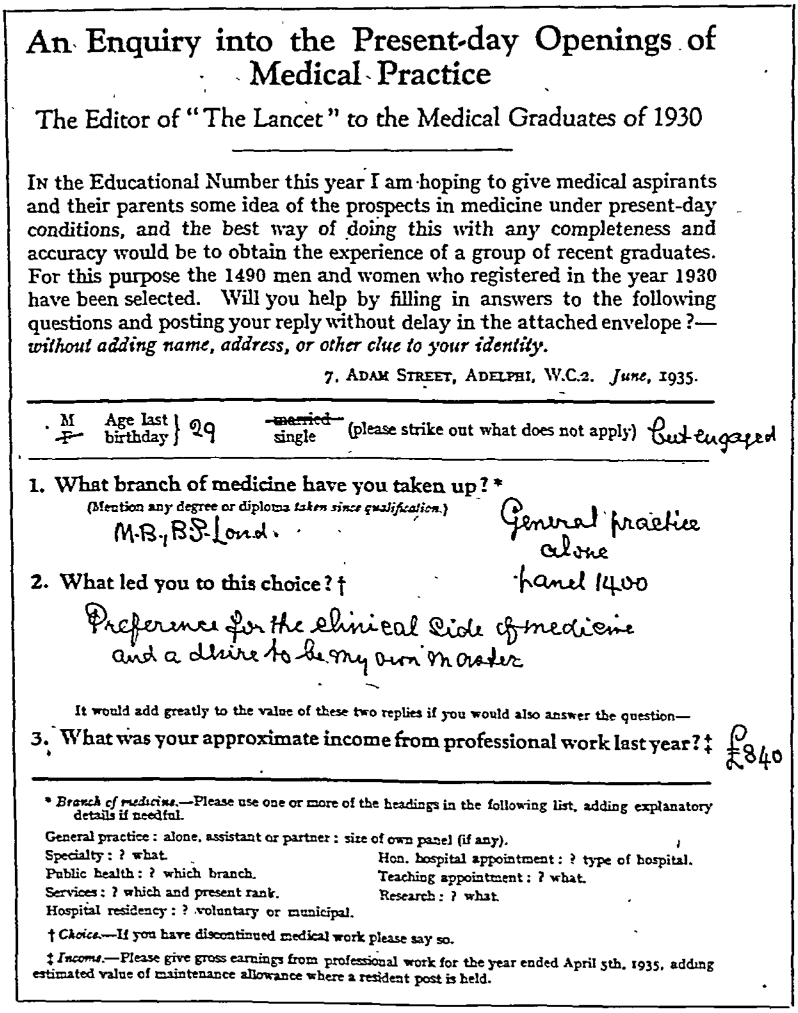
[1] See THE LANCET, July 27th, 1935, p. 215.



An Enquiry into the Present-day Openings of Medical Practice

The Editor of "The Lancet" to the Medical Graduates of 1930

In the Educational Number this year I am hoping to give medical aspirants and their parents some idea of the prospects in medicine under present-day conditions, and the best way of doing this with any completeness and accuracy would be to obtain the experience of a group of recent graduates. For this purpose the 1490 men and women who registered in the year 1930 have been selected. Will you help by filling in answers to the following questions and posting your reply without delay in the attached envelope?—*without adding name, address, or other clue to your identity.*

7, ADAM STREET, ADELPHI, W.C.2. *June*, 1935.

M ~~F~~ Age last birthday } 29 ~~married~~ single (please strike out what does not apply) But engaged

1. What branch of medicine have you taken up? *
(Mention any degree or diploma *taken since qualification.*)
M.B., B.S. Lond. General practice alone panel 1400

2. What led you to this choice? †
Preference for the clinical side of medicine and a desire to be my own master

It would add greatly to the value of these two replies if you would also answer the question—

3. What was your approximate income from professional work last year? ‡ £840

* *Branch of medicine.*—Please use one or more of the headings in the following list, adding explanatory details if needful.

General practice: alone, assistant or partner: size of own panel (if any).
Specialty: ? what.
Public health: ? which branch.
Services: ? which and present rank.
Hospital residency: ? voluntary or municipal.
Hon. hospital appointment: ? type of hospital.
Teaching appointment: ? what.
Research: ? what.

† *Choice.*—If you have discontinued medical work please say so.

‡ *Income.*—Please give gross earnings from professional work for the year ended April 5th, 1935, adding estimated value of maintenance allowance where a resident post is held.

AGE AND SEX

The 651 forms returned relate to 596 men and 55 women, a ratio of approximately 11 to 1. (A few, lacking information, were presumed to refer to males.) The ages lie mainly within narrow limits, for (measuring the percentages on those giving information on this point) it was found that 67 per cent. of the men and 70 per cent. of the women were of ages 27–30 inclusive. On the other hand, the range of ages recorded is very wide. Twenty-six years is the lowest in both sexes and, curiously, the highest in both sexes is fifty-three. It is not unlikely that a proportion at these older ages represent persons who graduated earlier in life but delayed registration, or persons of other nationalities who obtained a British qualification in 1930. This is so in at least six of the men who state that the inquiry is not applicable to them as they are graduates of earlier years, while at least nine replies relate to men of Indian nationality.

The age-distribution is shown in more detail in Table I.

BRANCH OF MEDICINE SELECTED

Analysis of the answers to this question shows that there is a certain amount of change with age. At ages 26–28 years 44 per cent. of the males are in general practice, and this figure rises to 56 per cent. at ages 30 and over. It is obvious that men who graduate relatively late in life cannot, on the average, afford the further waiting period before earning a livelihood that the adoption of specialisation entails. The proportion engaged in specialisation therefore tends to decline with age and the proportion in general practice to rise. No other significant changes with age are apparent, and in Table II. age is ignored and more detailed information with regard to the type of work selected is given for the correspondents as a whole.

Exactly one-half are found to be occupied with general practice, and of those specifying the type of practice 43 per cent. are in partnership, 37 per cent. are working alone, and 20 per cent. are assistants.

A question was asked about the size of panel (if any) but only answered by 143 of those in general practice. The man in partnership often gave the size of the total panel and not of his own. Of 61 in practice alone 23 had a panel of over 1000, the average being 860 and the largest 2310. Of 17 in partnership the personal panel averaged 510, the highest being 1300 and only 3 above 1000.

TABLE I.—*Age*

Age last birthday.	Number of registered persons.	
	Male.	Female.
26	13	1
27	79	6
28	96	13
29	93	8
30	90	10
31–34	96	6
35–39	47	5
40 and over ..	21	4
Not stated ..	54	2
Total ..	589*	55

* Excludes six graduates of earlier years and one reported dead.

Nearly one-quarter of the total are engaged in specialties (taken in a wide sense), while another 7 per cent. hold hospital appointments and 5 per cent. are occupied in teaching and research—and individuals in both these latter groups may be aiming at eventual specialisation.

TABLE II.—*Branch of Medicine*

Branch of medicine chosen.	Males.	Females.
	Number and percentage in this branch.	Number and percentage in this branch.
General practice—		
Assistant	51 (8·8)	3
Partner	107 (18·4)	2
Alone..	92 (15·9)	3
Unspecified	41 (7·0)	1
Total	291 (50·1)	9 (18·0)
Specialties—		
Surgery	62 (10·7)	3
General medicine ..	18 (3·1)	—
Various	59 (10·2)	15
Total	139 (24·0)	18 (36·0)
Hospital appointments—		
Municipal	30 (5·2)	6 (12·0)
Unspecified	12 (2·1)	2 (4·0)
Public health	41 (7·0)	13 (26·0)
Defence services and I.M.S.	28 (4·8)	—
Teaching and research	29 (5·0)	2 (4·0)
Unclassified	10 (1·7)	—
Grand total ..	580* (100)	50 (100)

* Excludes nine of Indian nationality.

Seven per cent. have entered the public health services, and, roughly, 5 per cent. the defence services, including the I.M.S. under this title. Only two of the males report that they have given up the profession (a further one wishes to give up), one is in temporary work, and only two report that they have been unable to find permanent employment. Of the 55 females, five have given up medical work—three on marriage, one for reasons of health, and one for work in law. Of the 50 still at work about one-quarter are in the public health services, mainly occupied with child welfare and prenatal care of the mother, and over one-third in some kind of specialty—e.g., medical missionary work, obstetrics and gynæcology.

Further details of the specialties taken up by the males are given in Table III. It may be observed that nearly half those specialising have gravitated to some branch of surgery, and a little over half to some other form of specialisation.

TABLE III.—*Specialties*

Specialty selected.	Males so occupied	Specialty selected.	Males so occupied
General medicine ..	18	Surgery (general and unspecified)	37
Obstetrics and gynæcology	14	Ophthalmic surgery and ophthalmology	12
Radiology	6	Ear, nose, and throat	7
V.D. and dermatology	7	Orthopædics	5
Dental surgeon ..	4	Urological surgery ..	1
Missionary	9	Total	139
Children's diseases..	3		
Other	16		

ADDITIONAL QUALIFICATIONS

Of the 580 males 231, or 40 per cent., report that they have taken further qualifications since registration (in numerous cases more than one). As would be expected there is here a very large difference between those engaged in general practice and those in specialties. Of the 291 in general practice only 61, or approximately one-fifth, have secured a qualification subsequent to their graduation, while of the 210 engaged in specialising, in hospital appointments, and in teaching and research, 130, or nearly two-thirds, have done so. The difficulty in general practice is expressed by one who writes: "I try to study for M.R.C.P. but spare time is hopelessly inadequate."

The proportion is naturally higher among those in public health work; of the 41 so employed 32, or 78 per cent., have taken a further qualification. On the other hand, of the 28 in the defence services and I.M.S. only 7, or one-quarter, have gone beyond their registrable qualification.

Table IV. shows the further qualifications acquired by both sexes. Of the 50 women still at work exactly half had taken some further qualification.

TABLE IV.—*Additional Qualifications*

Degree or diploma.	Number with each further qualification.*	
	Males.	Females.
M.B., or equivalent.. ..	51	5
M.D.	51	6
F.R.C.S.	52	2
D.P.H.	42	13
M.R.C.P.	46	2
M.Ch. or M.S.	9	—
D.P.M.	10	—
D.T.M. & H.	17	2
Various (not more than 5 of each)	43	3

* This table gives the number of times each qualification was recorded. It does *not* show the number of persons with a further qualification, for the same person may, *and quite frequently did*, have two or more qualifications.

GROSS INCOME EARNED

Without doubt one of the most interesting aspects of this inquiry lies in the information provided as to the earning capacity of these recent graduates. This information was given freely and presumably with broad accuracy in nearly all cases. With resident posts it is sometimes doubtful whether the value of board and lodging has been included in the income given. In the few cases in which it is clear that it has not been included, £150 has been added to the income given. On many forms relating to men working abroad the incomes are expressed in foreign currencies (rupees in most cases), and these have been converted into sterling. These incomes of men abroad are analysed separately from those at home. It must be remembered that the information asked was *gross* income—i.e., *earning capacity*—and the heavy liabilities that must often have been incurred (purchase of practice, cost and upkeep of car) must not be forgotten.

Table V. shows the average income earned in different capacities. The list is easily headed by those in practice, alone or in partnership, whose average earnings were, roughly, £900 *in the year in question*. It is this group that has too the highest outgoings: 25 per cent. may reasonably be deducted for expenses, more no doubt from the higher incomes. But even so a figure of £700 should cover most of the essentials and some of the amenities of life.

Assistants in general practice averaged £400 in the year, and those engaged in some form of specialisation were at approximately the same figure. Those engaged in teaching and research posts earned the least, with an average of £360. Those in the various public services averaged approximately £450–£550.

The few women in each category earned an average income which was, except in municipal hospital appointments, appreciably below that of the men. The average income of those in posts abroad, in foreign countries or in the British Empire, was computed to be £580 for 79 men giving sufficient information and £350 for 9 women.

TABLE V.—*Individual Incomes*

Average income (gross) earned in different branches of medical work

—	Males.	Average income.*	Females.	Average income.*
General practice—				
Assistant	48	£400		
Alone	72	£910		
Partner	100	£910		
Unspecified	32	£780		
Total	252	£800	6	£400
Specialties (all, including unspecified hospital appointments) ..	112	£390	9	£290
Public health	31	£500	12	£370
Defence services (excluding I.M.S.)	17	£550	—	—
Municipal hospital appointments	26	£440	6	£380
Teaching and research ..	26	£360	—	—
Working abroad ..	79	£580	9	£350

* To nearest ten.

These figures of average incomes show very broadly the differences between the various groups but, like all averages, they suffer from the disability that they conceal the enormous variability around them. It is of no comfort to the pauper to be told that the average income of himself and a millionaire is £500,000. It is important to pass beyond these averages and to show the distribution of incomes earned. In Table VI. this distribution is shown for the various types of general practitioners (the table excludes one who through illness earned nothing). The majority (approximately two-thirds) of those acting as assistants earned between £300 and £500, but the range extends from £200 to £600. This variability is very much less than that shown by those who have set up alone. The extremes in this group are £60 and £2042! Taking broad groups gives the result that roughly one-tenth earned less than £300, about one-fifth between £300 and £600, one-quarter between £600 and £1000, and nearly half over £1000.

TABLE VI.—*General Practice*

Distribution of incomes earned in general practice (Males in British Isles)

Gross income during year.	Assistants and locums.	Alone.	Partnership.	Unspecified.
Less than £100	—	2	—	—
£100–	—	3	—	—
£200–	6	3	—	4
£300–	13	4	6	3
£400–	17	1	1	5
£500–	10	8	10	5
£600–	2	2	10	2
£700–	—	2	8	1
£800–	—	13	22	1
£1000–	—	24	33	7
£1500–	—	8	8	3
£2000 and over	—	2	1	1
Total	48	72	99*	32

* One earned nothing in the previous year, being engaged in post-graduate study.

With those in partnership the range is a little less wide, but even here it extends from £300 to £2125 (excluding one who earned nothing in the year in question, being engaged in study). Broader classification gives none below £300, about one-fifth between £300 and £600, and two-fifths in each of the groups £600–£1000 and over £1000.

Table VII. gives the income distribution for the other branches of work. The lower limit of those engaged in specialising or in teaching and research is no earned income at all, for there were 14 individuals occupied in post-graduate study (this also applies to one in the public health category who was studying during the previous year). There are a few individuals—e.g., dental surgeons, radiologists—in the over £1000 category, but the general run of incomes is much below the *gross* earnings of the general practitioners: of those included in the specialty group one-tenth earned less than £100, nearly one-third between £100 and £300, another third between £300 and £500, and only 28 per cent. earned £500 or over.

TABLE VII.—*Other Branches*

Distribution of incomes earned in different branches of medical work other than general practice (Males)

Gross income during year.	All specialties.*	Public health.	Defence services.	Municipal hospital appointments.	Teaching and research.	In work abroad.
None	10	1	—	—	4	2
Less than £100–	1	—	—	—	1	1
£100–	11	—	—	2	1	4
£200–	22	2	1	2	2	7
£300–	19	2	—	5	4	8
£400–	18	6	6	4	7	10
£500–	13	13	4	10	4	16
£600–	7	3	—	2	2	11
£700–	3	4	5	1	—	3
£800–	1	—	1	—	—	6
£1000–	5	—	—	—	1	8
£1500–	1	—	—	—	—	2
£2000 and over	1	—	—	—	—	1
Total	112	31	17	26	26	79

* Including unspecified hospital appointments.

The public health workers and those in municipal hospitals lie mainly between £300 and £600. Of the 26 persons in teaching and research 73 per cent. earned less than £500, while of those abroad 58 per cent. earned this amount or more.

TABLE VIII.—*Proportion of Males in Broad Income Groups in different occupations*

Gross income during year.	General practice.	Specialties, teaching, and research (percentages).	Public health, municipal hospitals, and defence services.	Abroad.
Less than £100	0·8	11·6	1·3	3·8
£100–	6·3	26·1	9·5	13·9
£300–	20·0	34·8	31·1	22·8
£500–	19·6	18·8	43·2	34·2
£700–	18·7	2·9	14·9	11·4
£1000 and over	34·6	5·8	—	13·9
Total	100·0	100·0	100·0	100·0

For ease of comparison the proportions falling in different broad income categories are shown in Table VIII. in four classifications of work—namely, (1) general practice, (2) specialties, teaching, and research, (3) public health, municipal hospitals, and defence services, and (4) abroad. This table shows clearly the delay in earning capacity that specialisation entails. More than one-third of the men in this category earned less than £300, compared with only 7 per cent. of those in general practice, while the *gross* earnings of nearly three-quarters of the latter reached or exceeded £500, compared with only about one-quarter of the former.

In addition to the incomes shown in these tables there were seven unclassified, two of which were nothing, three were salaries of less than £300 of men in temporary work, and three lay between £500 and £600.

The number of women involved is too small to allow any detailed analysis of their incomes. Of the 33 included in Table V., 2 earned nothing, 9 between £100 and £300, 12 between £300 and £500, and 10 over £500.

CIVIL STATE

These differences in earning capacity lead inevitably to a very large difference between the marriage rates. Taking the broad type-of-work groups of Table VIII. the proportions of men that have married are 66 per cent. in general practice, 42 per cent. in the public services (including municipal hospital appointments and the defence services), and only 35 per cent. in the group engaged in specialising, teaching, and research. Indeed the reason quite frequently given for the selection of general practice was the desire to get married, and the consequent immediate need of an adequate income. One man complains that "posts do not exist for young married men even with good hospital experience in whole-time municipal work." Other reasons for selecting a particular branch of the profession are discussed in the section below. These answers do not lend themselves to tabulation (very often the reason given is no more than "preference" or "inclination"), and therefore only a general discussion of them will be given, with attention to answers of particular interest.

REASONS FOR CHOICE

Amongst the general practitioners the most frequent answer to the question, what led you to choose this or that branch of medicine, is, as would be expected, the immediate need of an income and the lack of means to allow specialisation. As one graduate tersely expresses it, "I *had* no choice. I had to live." It is quite clear that a proportion, which, as far as information is provided, appears fairly small, regrets this force of circumstances. Some had already failed to secure other jobs, and a few openly regret the choice they made. Two or three admit interestingly that they entered general practice to gain experience for consulting work.

Other factors in general practice which appealed to an appreciable number of those who made it their choice are the possibility of following a country life, the independence of superiors, and the "human element" or "sympathetic intimacy" which this form of work offers. The general practitioner becomes, one says, "family doctor, legal adviser, and confidant." The variety of the work, especially, as several remark, in conjunction with opportunities offered at local hospitals, appeals to many, and is summed up by one who says "specialism would bore me." There is in fact some evidence that in general practice is being found a satisfaction missed in other branches.

It is interesting to observe, too, the "force of heredity." Of those in general practice 31, or roughly 1 in 9, were following in their fathers' footsteps. The "force" appears to reach its maximum in the student who reports that his desire was to be an engineer but that his grandfather, father, three uncles, two aunts, and one brother were already doctors! Medicine, another said, is a family failing. This factor is also apparent amongst those following some specialty, of whom 12, or about 1 in 12, regard it as influencing their choice.

In general the reasons given by this group are somewhat indeterminate, the majority either stressing the specific interest of the work they have selected or asserting its superiority by invidious comparisons with general practice. In the latter they think there is monotony, a lack of regular hours or free time for other interests, the objection of night work, the lack of time to give to each patient, and finally the "burden of the panel system" and the "commercialisation of general practice." A proportion of those specialising have been led to it by their particular interests being aroused in their undergraduate days, by the encouragement of their tutors, and by an ambition to gain further experience and knowledge. "To do one job well rather than be mediocre in all," one expresses it. Ill-health has made general practice inadvisable in a few cases. "Mechanical aptitude" is advanced as a reason for selecting surgery as a career.

The workers in public health naturally lay stress on the advantages of a steady income, settled hours, and eventual pension. As one says, "It is a safe job; the monthly cheque arrives, there are no bills to send out, no bad debts, and no initial outlay of capital." There is also amongst them a fairly widespread belief in the future and expansion of the field of preventive medicine and of the municipal hospital system.

SUMMARY AND CONCLUSIONS

In this article an analysis is made of the replies to a questionnaire returned by 651 medical men and women resident, mainly, in Great Britain: 596 of these persons were men and 55 were women, a sex ratio of 11 to 1. Two-thirds belonged to the age-group 27–30 years. Just one-half of the males had entered general practice, a little over one-quarter were engaged in some form of specialisation (including teaching and research), and approximately 12 per cent. were in the public health services in this country or abroad (including in this category the defence services). Further qualifications have been obtained by 40 per cent. of the males, the distribution being 21 per cent. amongst general practitioners, 62 per cent. amongst those specialising, and 78 per cent. amongst those in the public health service (excluding those in the defence services).

Of the general practitioners nearly three-quarters had a *gross* income last year reaching or exceeding £500. Of those specialising only just over one-quarter exceeded this figure, of those in the public health service nearly 60 per cent. Two-thirds of the general practitioners had been able to marry as opposed to 35 per cent. of those specialising and 42 per cent. of those engaged in public health work.

Taking the replies as a whole it is clear that these recent graduates have settled in their profession with a substantial degree of success. Naturally enough there is a number who have definitely been unsuccessful, who think, as one says, that the prospects are "bleak and depressing," and that the opportunities in the future of obtaining satisfactory remunerative work are slender. But it does not appear to be a large number. Whether these persons are in such a minority through a tendency for the successful to reply to the questionnaire rather than the unsuccessful we cannot determine. It is possible that the sample here analysed may present too favourable a picture of the profession. While hoping that it does not, we must bear the proviso in mind in drawing any conclusions from the results.

THE MEDICAL SERVICES

NAVAL MEDICAL SERVICE

THE Naval Medical Service now offers to well-qualified medical men a very satisfactory career, with excellent opportunities for the practice of their profession and for specialisation in many subjects; the pay is good, and so is the prospect of promotion to the higher ranks with an adequate pension on retirement.

The following information embodies the principal conditions of service.

Entries will be on a Short Service basis, and will be for an initial period of 3 years, to be extended to 5 years at the discretion of the Admiralty.

Officers leaving the service at the end of 3 years will be eligible for a gratuity of £400, whilst those who leave at the end of 5 years will receive £1000.

Officers may be transferred to the Permanent List at the discretion of the Admiralty on completion of 5 years' Short Service. A gratuity of £1000 will be paid, but the Officer will be required to render a minimum of 25 years' service in order to qualify for full pension, including seniority granted, if any, in respect of Civil Hospital time. With regard to the latter, antedate of seniority of not more than one year may be allowed in respect of resident appointments in Civil Hospitals held prior to entry to the R.N. Medical Service. The antedate will count for seniority and eligibility for increase of pay, and if the officer is transferred to the permanent list it will count also as service for the purposes of promotion and retired pay, or gratuity on retirement.

Opportunities will be afforded for officers to specialise during the course of their career, and the number of Specialists posts carrying additional emoluments is 83.

The age of retirement in the case of Surgeon Commanders is 55, and in the case of Surgeon Captains 57.

Candidates *must not* be above the age of 28 years.

KITCHENER MEDICAL SCHOLARSHIPS

By arrangement with the Lord Kitchener National Memorial Fund these Scholarships may be awarded to the sons of Officers and Men or of ex-Officers and Men of H.M. Forces who desire to take a medical training with a view to obtaining a regular Commission in the Medical Services of the Navy, Army, or Air Force. Since the cost of Scholarships awarded to Candidates who enter the Royal Navy is borne by Naval Funds, a sum not exceeding the total value of the Scholarship will be deducted, at the discretion of the Admiralty, from any gratuity which may be payable to a Scholarship holder who fails to serve for 15 years in the Royal Navy.

MEDALS AND PRIZES

Gilbert Blane Medal.—This Medal is awarded annually to the Surgeon Lieutenant-Commander who obtains the highest aggregate marks at the examination for promotion to the rank of Surgeon Commander. The award is subject to the approval of the Presidents of the Royal College of Physicians and Surgeons respectively and the Medical Director-General of the Navy.

Other awards and prizes open to Naval Medical Officers are the Chadwick Naval Prize, the North Persian Forces Memorial Medal, and the Parkes Memorial Prize.

PAY AND ALLOWANCES

The old regulation by which officers were admitted direct to the Permanent Service by examination is now abolished. No examination for entry is held, but candidates will be required to present themselves before a Selection Board at the Admiralty presided over by the Medical Director-General of the Navy, to whom application should be made for further details.

Full Pay (as from July 1st, 1935)

		£		£	
SURGEON LIEUTENANT (short service and permanent service)	from	438	to	478	per annum.
SURGEON LIEUTENANT-COMMANDER (promoted after six years' service)	„	578	„	611	„
SURGEON COMMANDER (promoted after a further six years' service)	„	742	„	1058½	„
SURGEON CAPTAIN (promoted by selection)	„	1074	„	1320	„
SURGEON REAR-ADMIRAL (promoted by selection)		1734			„
MEDICAL DIRECTOR-GENERAL ..		2262½			„

Allowances

An outfit allowance of £50 towards cost of uniform is given.

Allowances when in charge of hospitals and sick quarters ..	10*s.* and 5*s.* per diem.
Eighty-three Specialist allowances of	5*s.* per diem.
Allowances to Senior Medical Officers in flagships	5*s.* and 2*s.* 6*d.* per diem.

Accelerated promotion can be gained under certain conditions: provision allowance and lodging allowance are paid when victualling and accommodation are *not* provided. Servant's allowance is also payable in certain appointments.

The extra allowances alluded to in this Table are *not to be looked upon as very exceptional.* About a quarter of the Medical Officers of the Navy are drawing extra allowances.

PENSION

Naval Officers retire at certain ages according to the rank they have attained. Except for those promoted to the 40 higher posts, the usual retiring age is 55 as Surgeon Commander, the appropriate pension according to scale being £543 per annum.

The current scale of pensions is as follows:—

	Maximum retired pay.			
SURGEON VICE-ADMIRAL ..	£1082	per annum on vacating office.		
SURGEON REAR-ADMIRAL ..	£914½	per annum at age of		60.
SURGEON CAPTAIN	£814½	„	„	57.
SURGEON COMMANDER	£543	„	„	55.
SURGEON LIEUTENANT-COMMANDER AND SURGEON LIEUTENANT	£407½	„	„	45.

Officers permitted to withdraw receive gratuities on the following scale:—

	£
Over 10 and under 15 years' service ..	500
„ 15 „ „ 18 „ „ ..	1800
„ 18 years' service	2700

Dental Branch

Candidates, who must be qualified dental surgeons and below the age of 28 years, are required to produce *certificates of birth*, registration, and of character, and must be physically fit for active service anywhere. An outfit allowance of £50 is payable to officers finally entered and commissioned. The rank of Surgeon Lieutenant-Commander (D) is attained on the completion of six years' satisfactory service. Promotions to Surgeon Commander (D) and Surgeon Captain (D) are made *strictly by selection* from the rank next below and are confined to officers who prove fitted in every respect for these ranks. The present establishment of dental officers is: 1 Surgeon Captain (D), 3 Surgeon

Commanders (D), 60 Surgeon Lieutenant-Commanders (D) and Surgeon Lieutenants (D).

Provision has been made for candidates who have held, or who, at the time of passing the examination hold or are about to hold, an appointment as Dental Officer in a recognised Civil Hospital to be allowed to serve in such appointment after the date of entry into the R.N. The time concerned, provided it does not exceed six months, may reckon for increase of full pay while on the active list.

On the completion of two years' service in the rank of Surgeon Lieutenant-Commander (D), dental officers on the Active List are eligible for a three months' post-graduate course at a dental hospital and school at the public expense, and will draw full pay while attending the course.

Pay.—The rates of full pay for Dental Officers (as from July 1st, 1935) are as follows:—

	£ £
Surgeon Lieutenant (D)	362–447
Surgeon Lieutenant-Commander (D) (promoted after six years' service)	535–660
Surgeon Commander (D) (promoted by selection to fill vacancies in Establishment)	703–900
Surgeon Captain (D) (promoted by selection to fill vacancy in Establishment)	1031–1281

The Regulations regarding Pension and Withdrawal Gratuities are the same as for Medical Officers in the corresponding Ranks.

ARMY MEDICAL SERVICE

Royal Army Medical Corps

THE appointment of officers to the Royal Army Medical Corps will, in the first instance, be by means of a Short Service Commission for a period of five years. In the fifth year of service an officer will be given the choice of retiring with a gratuity of £1000 or of applying for a permanent commission. Those retiring with a gratuity after five years' service will be liable to be called up for duty in the event of a national emergency arising during the twelve years following their retirement.

New entrants are commissioned in the rank of Lieutenant, and the first three months of their service are on probation, during which time they undergo a course at the Royal Army Medical College in London, in Hygiene, Tropical Medicine, Entomology, &c., &c., in addition to their military training at the Royal Army Medical Corps Depôt at Aldershot. A grant of £50 is made for the purchase of uniform.

An entrant who is holding or who is about to hold at the time of entrance an approved whole-time appointment at a recognised Civil Hospital may be seconded while holding such appointment up to a maximum period of 12 months. A candidate who has held such an appointment within six months of entry may be granted an antedate up to 12 months in respect of the period the appointment was held. The period of secondment or antedate will not reckon in diminution of the period of five years which he is required to serve on a short service commission, but on completing one year of actual service in the R.A.M.C. the period of secondment or antedate will count for seniority.

If appointed to a permanent commission the period of secondment or antedate will count as service for promotion to the rank of Major, increases of pay in the ranks of Captain and Major, and retirement on retired pay or with gratuity.

PROMOTION

Promotion to Captain will be after one year's commissioned service on full pay. If appointed to a permanent commission promotion to the rank of Major will be on completion of 10 years' commissioned service. Promotion to the ranks of Lieutenant-Colonel and Colonel will be by selection to fill vacancies within the establishment which is designed to allow promotion to those ranks on the average after 17 and 25 years' service respectively.

PROFESSIONAL OPPORTUNITY

The possibilities for good work are very great. There is scope for original research in tropical diseases, in preventive medicine, and in bacteriology, as well as in the large clinical field open to the specialist in Medicine, Surgery, Gynæcology, Diseases of the Ear, Nose, and Throat, Ophthalmology, and Venereal Diseases. Child Welfare is also undertaken systematically by officers of the R.A.M.C.

FOREIGN SERVICE

The tour of foreign service in India or the Mediterranean Stations is five years, that of the Colonies three years, but in the case of those officers retiring on a gratuity after five years' service, arrangements would be made for them to return to England at public expense by the end of that period.

POST-GRADUATE STUDY

A permanent commissioned officer will, between his sixth and tenth year of service, undergo a course of post-graduate study at the Royal Army Medical College and the London hospitals of five months' duration, followed by a course of study of a special subject selected by himself, provided he has shown special aptitude in the post-graduate course or during his previous service. During this course of study he remains on full pay, and the fees for the course are paid by the State.

When qualified in his special subject, the officer up to and including the rank of Lieutenant-Colonel becomes entitled to specialist pay at 4*s.* 6*d.* per day when holding a specialist appointment.

PAY AND ALLOWANCES (HOME RATES)

The rates of pay and allowances for officers are at present as shown in the Table, but the allowance rates vary slightly from time to time. In addition, specialist pay and charge pay are given under certain conditions as noted below.

ADDITIONAL PAY

An officer below the substantive rank of Colonel holding an appointment as specialist receives 4*s.* 6*d.* a day, in addition to his ordinary pay.

The Adjutant, R.A.M.C. Depôt, receives 5*s.* a day in addition to his ordinary pay.

CHARGE PAY	Daily. *s.*	*d.*
(*a*) An officer below the substantive rank of Colonel in charge of a hospital of 50 beds and over, or in charge of a medical or surgical division of a general hospital with at least 300 beds	5	0
(*b*) Senior Medical Officer, Royal Arsenal ..	5	0

Assistant Professors at the Royal Army Medical College (Lieutenant-Colonels) receive pay and allowances of their rank plus £90 10*s.* a year.

GRATUITIES; SHORT SERVICE OFFICERS

The gratuity of £1000 granted on retirement, after five years' service as a medical officer to a short service officer who does not obtain a permanent commission is generous, and should go a long way to enable an officer on leaving the Service towards establishing himself in Civil life.

Entry takes place twice yearly at the beginning of May and November.

Regulations for admission, giving full details and application forms, should be obtained from the Assistant Director-General, Army Medical Services (A.M.D.1), The War Office, Whitehall, London, S.W.1.

TABLE SHOWING PAY AND ALLOWANCES (HOME RATES)

Appointment.	Pay.*	Rations †	Servant.	Married.‡			Unmarried.		Approximate total per annum.	
				Lodging.	Fuel and light (average)	Furniture allowance	Lodging.	Fuel and light (average)	Married.	Unmarried.
	A day. £ s. d.	A day. s. d.	A day. s. d.	A day. s. d.	A day. s. d.	A day. s. d.	A day. s. d.	A day. s. d.	£	£
Lieutenant	0 19 10	1 3	2 0	3 6	1 7	2 0	2 6	0 8	552	481
Captain	1 4 6	1 3	2 0	4 6	2 8	2 0	2 6	0 8	675	566
After 6 years' service ..	1 7 2	1 3	2 0	4 6	2 8	2 0	2 6	0 8	724	614
„ 8 „ „ ..	1 9 4	1 3	2 0	4 6	2 8	2 0	2 6	0 8	763	654
Major	1 14 0	1 3	2 0	4 6	2 10	2 0	4 0	1 3	852	777
After 13 years' service ..	1 18 6	1 3	2 0	4 6	2 10	2 0	4 0	1 3	934	859
„ 16 „ „ ..	2 0 8	1 3	2 0	4 6	2 10	2 0	4 0	1 3	973	899
„ 18 „ „ ..	2 5 4	1 3	2 0	4 6	2 10	2 0	4 0	1 3	1055	981
„ 22 „ „ ..	2 8 10	1 3	2 0	4 6	2 10	2 0	4 0	1 3	1120	1045
Lieutenant-Colonel	2 12 0	1 3	2 0	4 6	3 0	2 0	4 6	2 4	1183	1134
After 3 years' service as such	2 16 6	1 3	2 0	4 6	3 0	2 0	4 6	2 4	1265	1217
Colonel	3 3 4	1 3	2 0	5 6	3 11	2 0	5 6	2 8	1425	1366
Major-General	4 6 0	1 3	4 0	11 0	4 10	2 0	11 0	3 10	1992	1937
Director-General	5 8 8	1 3	6 0	13 9	5 5	2 0	13 9	4 5	2502	2447

* The rates of pay shown in the above Table are the rates issuable with effect from July 1st, 1935.

† These rates apply when rations cannot be issued in kind.

‡ A married officer for the purposes of furniture, lodging, fuel, and light allowances is one who is married and is 30 years of age or over.

RETIREMENT AND RETIRED PAY: OFFICERS HOLDING PERMANENT COMMISSIONS

The following are the rates of retired pay:—

1. Retired pay consists of two parts: (*a*) a service element based on the officer's total service; (*b*) a rank element for the rank from which the officer retires. An officer with less than 20 complete years' service will not be eligible to retire voluntarily on service retired pay.

2. The scale will be as follows:—

(*a*) Service element.—£13 11*s*. 6*d*. a year for each completed year of service as a medical officer.

(*b*) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£ s. d.	£ s. d.	£ s. d.
Major	10 17 3	10 17 3	108 12 6
Lieutenant-Colonel	135 15 0	27 3 0	217 4 0
Colonel	262 9 0	45 5 0	352 19 0
Major-General ..	398 4 0	45 5 0	488 14 0
Lieutenant-General	533 19 0	45 5 0	624 9 0

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below.

Maximum rates of retired pay (*a*) and (*b*) together:—

	£ s. d.		£ s. d.
Major	407 5 0	Major-General ..	905 0 0
Lieutenant-Colonel	543 0 0	Lieutenant-General	1086 0 0
Colonel	724 0 0		

3. Officers may be permitted to retire with a gratuity in accordance with the following scale:—

With less than 10 years' service as a medical officer	£1000
After 10 years' service as a medical officer ..	£1500
„ 15 „ „ „ „ ..	£2800
„ 18 „ „ „ „ ..	£3500

The Army Dental Corps

This Corps is administered by the Director-General, Army Medical Services. Regulations for admission to The Army Dental Corps should be obtained from the Under Secretary of State, War Office, and carefully studied.

OFFICERS: APPOINTMENT AND PROMOTION

1. Commissions as Lieutenants in The Army Dental Corps may be given to persons duly qualified under regulations approved by the Army Council.

2. An officer who is commissioned after holding an approved whole-time appointment in a recognised civil dental hospital or in the dental department of a recognised civil general hospital may be granted an antedate covering the period of his appointment, but not exceeding six months, provided that the interval between the termination of the hospital appointment and the date of entry into the Service does not ordinarily exceed six months. The period of such antedate will reckon towards promotion, increase of pay, gratuity, or retired pay.

3. An officer is eligible for promotion to the rank of Captain on completion of three and a half years' service and to the rank of Major on completion of 12 years' service in the Corps, provided he has previously qualified in such manner as may be prescribed by the Army Council.

4. Promotion to the rank of Lieutenant-Colonel and Colonel to fill the establishments laid down from time to time for those ranks is made by selection from those senior in the rank below. Dental officers are also eligible for special promotion by brevet.

PAY

The following are the rates of pay for officers of The Army Dental Corps.

	Per diem. £ s. d.
Lieutenant	18 2
Captain	1 2 8
Captain { after 8 years' total service ..	1 5 4
Captain { „ 10 „ „ „ ..	1 7 2
Major	1 11 8
Major, after 15 years' total service	1 16 2
„ „ 18 „ „ „	1 18 6
„ „ 20 „ „ „	2 3 0
Lieutenant-Colonel	2 9 10
Lieutenant-Colonel after 3 years' service as such	2 14 4
Colonel	3 1 2

CHARGE PAY

The officer in charge of the Dental Laboratories, Aldershot, receives charge pay at the rate of 5*s.* a day if holding the rank of Captain, or 2*s.* 6*d.* a day if holding the rank of Major.

ALLOWANCES

The allowances for officers of The Army Dental Corps are at the same rates as for officers of the Royal Army Medical Corps.

RETIREMENT AND RETIRED PAY OR GRATUITY

(1) The rates of retired pay will be the same as for officers of the Royal Army Medical Corps.

(2) Voluntary retirement on retired pay will not be allowed until after 20 years' service.

(3) Earlier retirement on gratuity may be allowed:—

After 8½ years'	service as a Dental Officer,	gratuity of £1000.
" 15 "		" £2000.
" 18 "		" £3000.

The aim of the Corps is the prevention of wastage on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier is reinspected at least once a year and the dental efficiency maintained at the best standard possible.

INDIAN MEDICAL SERVICE

COMPETITIVE examination remains suspended for the present and admission to the Service is on written application to the India Office. As sound bodily health is a first essential candidates may, if they wish it, undergo a preliminary examination by a Medical Board which meets weekly at the India Office.

Candidates must be under 32 years of age at the time of appointment, and must possess a qualification registered under the Medical Acts in force at the time of appointment. The Indian Medical Service is designed primarily to meet the needs of the Indian Army, but in order to maintain the necessary minimum war reserve of military medical officers, and to provide for European medical attendance for European officers of the Superior Civil Services and their families, local governments are required to employ a stated number of Indian Medical Service officers. The Government of India draw on the same Service to meet the requirements of the civil administration for which they are responsible. It is a definite condition of service that officers will be liable to serve on either the civil or the military side. All officers are required to perform at least one year's military duty subsequent to permanent appointment before they can be considered eligible for civil employment. Executive medical officers in both civil and military employment may attend persons unconnected with Government service provided their duty admits of it. On the military side, however, the opportunities for private practice are not great. The commissions of officers who before appointment have obtained certain higher qualifications or have held resident appointments in certain hospitals may be antedated by one year.

PROSPECTS

Although there are still two schools of thought with regard to the future prospects of the Indian Medical Service, the optimists have become more optimistic during the past year and the pessimists less pessimistic. Shrewd judges of the situation are now of opinion that the prospects of really good candidates are as bright as ever they were: perhaps not for those whose one object is to amass a fortune, but for men who are attracted by a service which offers a great variety of choice of interesting lines of work such as medical, surgical, public health, and research. The pay and pensions are attractive, though junior married officers must expect to live quietly if they are not to exceed their incomes. The cautionary notice in official announcements with regard to prospects of civil employ has been withdrawn, as it has now been decided in principle that a number of civil appointments must continue to be reserved for European I.M.S. officers, including attractive specialist posts and civil surgeoncies. The number of these has not yet been settled, and will no doubt be smaller than in the past; but highly qualified men have a reasonable assurance of securing congenial civil appointments after a period of military service of varying duration. Those who enter the Service at an early age have a definite advantage over those who delay till several years after qualification. The ideal course is to enter after spending a year in a resident hospital appointment; this year will be antedated, and the candidate can enter the Service with the rank and pay of a captain. An important point to note is that permanent commissions are granted at once so that an officer can look forward with confidence to a settled career, and is not subject to the risks of a short-service system. He reaps however the advantages of such a system, for he can retire voluntarily after six years with a gratuity of £1000, after twelve years' service with a gratuity of £2500, and many young doctors have joined with this intention; very few officers have actually taken advantage of the offer. Conditions of service have been constantly changing and are likely to go on changing in the future, but they have never been such as to prevent men of ability and enterprise from carving out distinguished careers for themselves.

RATES OF PAY

The monthly rates of pay for European officers of non-Asiatic domicile in the Service are as tabulated below. The rupee, it may be remembered, is worth 1*s.* 6*d.*

Rank and service in rank.	Basic pay.	Overseas pay.	Year of total service.
	Rs.	Rs.	
Lieut.	500	150	First
Captain :—			
1. During first three years' service as Captain.	650	150	Second
		150	Third
		150	Fourth
2. With more than three and less than six years' service as Captain.	750	£15	Fifth
		£15	Sixth
		£25	Seventh
3. With more than six years' service as Captain.	850	£25	Eighth
		£25	Ninth
		£25	Tenth
		£25	Eleventh
		£30	Twelfth
Major :—			
1. During first three years' service as Major	950	£30	Thirteenth and over
2. With more than three and less than six years' service as Major	1100		
3. With more than six years' service as Major	1250		
Lieut.-Colonel :—			
1. Until completion of 23 years' total service	1500		
2. During twenty-fourth and twenty-fifth years' total service	1600		
3. After completion of 25 years' total service	1700		
4. When selected for increased pay ..	1850		

NOTE TO TABLE

Until the completion of 23 years' total service basic pay is regulated according to rank and service in rank (column 1) which, owing to the system of accelerated promotion, may be in advance of the time-scale of promotion. Overseas pay is regulated solely with reference to length of total service (column 4). In addition to the above rates various allowances

(*Continued at foot of opposite page*)

Officers on arrival in India will be posted for one year to specially selected stations. Officers in military employment, when in command or second-in-command of the larger station hospitals, receive special allowances. On the civil side there are public health, bacteriological, research, and professorial appointments carrying special enhanced rates. Officers on appointment receive an outfit allowance of £50.

PENSIONS AND ALLOWANCES

The rates of pensions, as from July 1st, 1935, are as shown in the Table below.

Service.	Rates per annum.	Service.	Rates per annum.
After 17 years ..	£372	After 23 years ..	£576/10/-
„ 18 „ ..	400	„ 24 „ ..	614
„ 19 „ ..	428	„ 25 „ ..	651
„ 20 „ ..	465	„ 26 „ ..	697/10/-
„ 21 „ ..	502	„ 27 „ ..	744
„ 22 „ ..	539/10/-		

There are additional pensions ranging from £65 to £350 per annum for officers who have held high *administrative appointments* as colonels or major-generals.

Officers on appointment are provided with free passage to India, normally by transport. The wives and families of officers who are married prior to the date of the officers' embarkation on first appointment will also be given free passage to India subject to the payment of messing charges. Officers are granted a certain number of return passages home at Government expense during their career. There are special allowances for officers whilst on study leave.

Further particulars can be obtained on application to the Secretary, Military Department, India Office, Whitehall, London, S.W.1. Letters should be marked "Recruitment for I.M.S."

MEDICAL BRANCH OF THE ROYAL AIR FORCE

THE Air Council attach great importance to attracting into the service the best type of medical man, since on the capacity of the Medical Branch depends in a peculiar degree the safety and efficiency of the Air Force. The duties of a medical officer in the Air Force include not only the prevention and treatment of those ordinary diseases to which the personnel of any fighting service are liable, but the special study of the mental and physical stresses imposed on the airman in diverse circumstances and climates—a new branch of medicine which still provides considerable scope for research.

As promotion to the higher ranks of the Service is by selection, and as a certain proportion of the higher ranks are reserved for purely professional as opposed to administrative appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in his professional work.

The work to be done, therefore, has a high professional interest, combined with good rates of pay and allowances, so that a career is offered which should prove both attractive and interesting. The life is one which is certain to appeal to the man of wide outlook who desires opportunities for travel, sport, and games, and can find interest and enjoyment in aviation.

His duties will, as a matter of course, give him flying experience as a passenger, which is necessary for the proper study of the medical problems of aviation and for gaining first-hand knowledge of the conditions under which his comrades serve. He may also, if he wishes, undergo a certain amount of training as a pilot, when this can be arranged without interference with his duties.

The establishment consists partly of permanent and partly of short-service officers, and an officer on entry is granted a short-service commission for a period of three years on the active list (extensible to five years if the officer so wishes, on the recommendation of the Director of Medical Services) and of four years in the Reserve of Air Force Officers. Selections for permanent commissions are made from officers holding short-service commissions who are considered to be suitable and who desire a life career in the service. Those who are not selected are transferred to the Reserve at the expiration of their period of service on the active list.

But the short-service commission with its gratuity after three or five years is in itself an attraction to many entrants who desire to enlarge their experience and outlook from the point of view of subsequently entering private practice, and who, on entry, have not made up their minds to the adoption of a permanent career in the Service.

For certain purposes medical officers may be allowed to count as service their time spent in approved whole-time post-graduate appointments in civil hospitals under certain well-defined and generous conditions.

At about five years' service all permanent officers who are judged suitable will be given the opportunity to take a course of specialist study. The period allowed will vary with the subject of study, but normally about nine months will be available to each officer, during which full pay and allowances will be issued. Their subsequent career will normally be as follows. Approximately three-quarters of the employment of squadron leaders and senior flight lieutenants is in specialist posts, though these are not generally of a full-time specialist character. On reaching the rank of wing commander, the policy is to allow a proportion of officers to become permanent specialists and to be employed continuously throughout the remainder of their career in full-time specialist posts. Rather more than a quarter of the officers will become permanent specialists and continue to be employed as such throughout their service in the ranks of wing commander and group captain. In addition there are a number of hygiene posts in the former rank open to specialists in that subject, bringing the proportion of specialist posts in the rank up to nearly a half of the total posts. In the rank of group captain, apart from the posts already mentioned as available for the permanent specialist, employment is nearly equally divided between posts in charge of a large hospital and headquarter administrative posts. This statement indicates the position as regards specialist employment as at present foreseen. No guarantee can be given, of course, that the career of an individual will necessarily conform to this forecast.

New entrants into the Royal Air Force Medical Branch are commissioned as Flying Officers (Medical), and are eligible for promotion to the rank of Flight Lieutenant (Medical) after one year's service on full pay. Permanent officers are normally promoted to the rank of Squadron Leader after ten years' total service. Accelerated promotion may be granted after the completion of eight years' service to officers qualified to hold specialist appointments. Promotion within establishment to the ranks of Wing Commander and above is by selection. The number of permanent commissions granted yearly is regulated with iew to all suitable permanent officers being p

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(Continued from previous page)

are admissible for a large number of special appointments on both the military and the civil side which may be held by members of the I.M.S. Special high rates of pay are also attached to the numerous administrative appointments open to officers in both branches of the Service. The appointment of Director-General, I.M.S., which is held by an I.M.S. officer, carries pay of Rs.3500 per mensem. The appointment of Director of Medical Services in India, carrying pay at Rs.3200 per mensem, may also be held by an officer of the Indian Medical Service.

ROYAL AIR FORCE MEDICAL BRANCH: RATES OF PAY AND ALLOWANCES

Rank.	Pay.*		Cash allowances at home rates in lieu of quarters, rations, and servant, if not available in kind (yearly).†		Pay plus allowances yearly.	
	Daily.	Yearly.	Married.	Unmarried.	Married.	Unmarried.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Flying Officer	1 1 8	395 8 4	188 11 8	117 2 1	584 0 0	512 10 5
Flight Lieutenant	1 3 6	428 17 6	226 12 1	117 2 1	655 9 7	545 19 7
After 2 years as such	1 5 4	462 6 8	226 12 1	117 2 1	688 18 9	579 8 9
After 4 years as such	1 7 2	495 15 10	226 12 1	117 2 1	722 7 11	612 17 11
Squadron Leader	1 15 4	644 16 8	229 12 11	155 2 6	874 9 7	799 19 2
After 2 years as such	1 18 10	708 14 2	229 12 11	155 2 6	938 7 1	863 16 8
After 4 years as such	2 0 8	742 3 4	229 12 11	155 2 6	971 16 3	897 5 10
After 6 years as such	2 4 4	809 1 8	229 12 11	155 2 6	1038 14 7	964 4 2
Wing Commander	2 9 10	909 9 2	232 13 9	184 0 5	1142 2 11	1093 9 7
After 2 years as such	2 11 8	942 18 4	232 13 9	184 0 5	1175 12 1	1126 18 9
After 4 years as such	2 17 0	1040 5 0	232 13 9	184 0 5	1272 18 9	1224 5 5
Group Captain	3 3 4	1155 16 8	304 3 4	244 17 1	1460 0 0	1400 13 9
Air Commodore	3 12 4	1320 1 8	360 8 9	305 13 9	1680 10 5	1625 15 5
Air Vice-Marshal	4 10 6	1651 12 6	421 5 5	366 10 5	2072 17 11	2018 2 11

* Except for periods of service under Indian administration. For such periods, officers receive pay and allowances at rates and subject to conditions authorised *from time to time by the Government of India.*

† *These allowances are issued only when accommodation, fuel and light, rations, and personal attendance are not available in kind. Normally, provision in kind is available for junior officers. "Married" rates of allowances are payable only to married officers who have reached the age of 30 or the rank of Squadron Leader. The rates and general scheme of allowances are liable to revision as circumstances may require.*

Wing Commanders and of a substantial majority of Wing Commanders being promoted to Group Captains. While the aim is to give entrants a career as above, no guarantee of promotion can be given to the individual officer, of course, since the number of vacancies for promotion must depend on the requirements of the Service from time to time.

There is no competitive examination on entry; candidates must be under 28 years of age, British subjects, the sons of British subjects, and of pure European descent, and are interviewed by a Board presided over by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce:—

1. Birth certificate. 2. Medical registration certificate. 3. A declaration containing the following information: (*a*) Age and place of birth. (*b*) That he is a British subject, the son of British subjects, and of pure European descent. (*c*) That he is ready to engage for general service at home or abroad as required. (*d*) The qualifications he is possessed of, and what medical or other appointments he has held (if any). (*e*) That he is willing to fly as a passenger whenever called upon to do so.

Each candidate is required, before acceptance, to pass a medical examination to ensure that he labours under no constitutional or mental disease or weakness, nor any imperfection or disability which may interfere with the efficient discharge of the duties of a medical officer in any climate, in peace or war.

On appointment entrants undergo an initial course of three months, during which they are given instruction in the special medical aspects of aviation, the organisation and administration of the Royal Air Force, and the general and special duties to be performed by officers in the Medical Branch.

In order to avoid the necessity for further examinations the position of entrants in order of seniority in the Air Force List is determined at the end of the initial course by a system of marking and reports on the actual work done during their instruction.

UNIFORM AND EQUIPMENT

Medical officers are required to provide themselves with the uniform, service dress, and mess dress of their rank, and with the distinguishing badges of the Royal Air Force Medical Branch. The provision of full dress is entirely optional at present. An allowance of £50 towards the cost of uniform is made on joining to candidates who have not had previous commissioned service in H.M. Forces.

EMOLUMENTS

The emoluments of medical officers of the Royal Air Force are given in outline below. The rates of pay are fixed on an inclusive basis, and the fact that specialist pay and charge pay are not payable as separate emoluments was taken into account when the rates were fixed.

ALLOWANCES AT STATIONS ABROAD

In addition to the pay shown above, officers stationed abroad are provided with furnished quarters (with fuel and light) and rations, or allowances in lieu, and receive colonial and servant allowances. The present annual total of the allowances (including colonial and servant allowances) payable when provision in kind is not available is as follows:—

Rank.	Egypt		Palestine		Malta		Malaya	
	M.	S.	M.	S.	M.	S.	M.	S.
	p.a. £	p.a. £	p.a. £	p.a. £	p.a. £	p.a. £	p.a. £	p.a. £
Flying Officer ..	432	221	440	231	278	135	621	272
Flight Lieutenant ..	432	221	456	231	278	135	621	272
Squadron Leader ..	432	272	458	284	278	151	621	298
Wing Commander ..	534	327	551	345	321	165	694	399
Group Captain ..	570	363	601	386	357	202	720	425

M. =married. S. =single.

The married rates are payable only when the officer is accompanied by his family. If unaccompanied he is treated as unmarried for the purposes of his own accommodation, or allowances in lieu, and receives a consolidated allowance in respect of the separated family as follows:—

Flying Officer	£109 p.a.
Flight Lieut. and Squadron Leader..	£136 ,,
Wing Cmdr. and Group Captain ..	£173 ,,

Iraq and Sudan.—Families are normally not allowed in these countries, and officers are provided with accommodation, &c., for themselves, and receive colonial and servant allowances. The present rates of colonial allowance amount to £142 p.a. (Iraq) and £55 p.a. (Sudan). In addition, married officers receive the consolidated allowance for separated families at the rates shown above.

Aden and Transjordan.—Families are normally only allowed at these stations if public married quarters are available. Married officers accompanied by their families are accordingly provided with married accommodation, &c., and receive a servant allowance of 2*s.* a day and a colonial allowance of 10*s.* a day at Aden and 7*s.* a day in Transjordan. Other officers are provided with unmarried accommodation and receive servant allowance of 2*s.* a day and colonial allowance of 5*s.* a day at Aden and 3*s.* 3*d.* a day in Transjordan. In addition, married officers separated from their families receive the consolidated allowance at the rates shown above.

The rates of colonial allowance in all commands are at present under review.

Retired Pay

The minimum period of service qualifying for retirement on retired pay is 20 years.

The scales of retired pay are as follows :—

AIR OFFICERS

Air Vice-Marshal ..	£714 10s. to £914 10s.	per annum.	
Air Commodore ..	£588 ,, £860	,,	,,

OFFICERS BELOW AIR RANK

Age on retirement.	Yearly rate of retired pay.	Years of service.	Addition for each extra year of service.*	Deduction for each deficient year of service.*
	£ s.		£ s.	£ s.
40	271 10	17	13 10	13 10
41	305 0	17	13 10	13 10
42	339 10	18	13 10	13 10
43	373 0	18	13 10	13 10
44	407 10	19	13 10	13 10
45	440 10	19	13 10	13 10
46	475 10	20	13 10	13 10
47	508 10	20	13 10	13 10
48	543 0	21	13 10	13 10
49	576 10	21	13 10	13 10
50	611 0	22	13 10	13 10
51	630 10	22	20 0	13 10
52	651 10	23	20 0	13 10
53	671 10	23	20 0	13 10
54	692 0	24	20 0	13 10
55	714 10	24	20 0	13 10

* Limited to five years.

The maximum rates of retired pay and the compulsory retiring ages for the several ranks are :—

Rank.	Yearly rate of retired pay.	Compulsory retiring age.
	£ s.	
Air Vice-Marshal ..	914 10	60
Air Commodore ..	860 0	57
Group Captain ..	814 10	57
Wing Commander ..	543 0	55
Squadron Leader ..	452 10	55

Gratuities.—A permanent officer allowed to retire before having qualified for retired pay may be granted a gratuity, namely :—

£1000 if he has 5 but less than 10 years' commissioned service.
£1500 ,, ,, 10 ,, ,, 15 ,, ,, ,,
£2800 ,, ,, 15 or more than 15 ,, ,, ,,

Short-service officers who complete their full period of service on the active list will normally be granted gratuity as follows on transfer to the Reserve :—

After 3 completed years	£400
,, 5 ,, ,, ...	£1000

These gratuities will not be payable to officers granted permanent commissions, but their service on a short-service commission will count towards retired pay.

COLONIAL MEDICAL SERVICE

THE Colonial Medical Service consists of the Medical Services in Bahamas, Barbados, Bermuda, British Guiana, British Honduras, British Solomon Islands Protectorate, Ceylon, Cyprus, Falkland Islands, Fiji, Gambia, Gibraltar, Gilbert and Ellice Islands Colony, Gold Coast, Hong-Kong, Jamaica, Kenya, Leeward Islands, Malaya, Mauritius, Nigeria, Northern Rhodesia, Nyasaland, Palestine, St. Helena, Seychelles, Sierra Leone, Somaliland, Tanganyika, Trinidad, Uganda, Windward Islands, and Zanzibar.

The various Colonial government medical departments employ some 1200 European medical officers and about the same number of qualified Asiatic and African medical officers who are appointed locally. Included in this total are about 30 qualified European women medical officers. About 850 trained nursing sisters and health visitors are employed, most of whom are Europeans. There are large numbers of subordinate personnel, sanitary inspectors, medical assistants, and dressers, most of whom are natives of the areas in which they serve.

Throughout nearly the whole of the Colonial Empire such diseases as malaria, yaws, leprosy, and hookworm disease menace the health of the indigenous people and retard development. In equatorial Africa sleeping sickness and plague persist, in West Africa yellow fever has not yet been eradicated, and in the Near and Far East outbreaks of cholera and plague occur from time to time. In addition to tropical diseases, those maladies usually met with in this country are prevalent throughout the Empire.

An officer in the Colonial Medical Service thus has unique opportunities for the practice of his profession. On joining a medical department his duties include medical, surgical, and public health work. He may be posted to an outlying or bush station where he will be responsible for all the medical activities in connexion therewith; or he may be attached for duty at one of the large hospitals. Every encouragement will be given him to pursue any specialist work in which he may be interested so far as the exigencies of the Service permit. Great importance is attached to a candidate's post-graduate experience, as in the outlying districts he will frequently be called on to deal with emergencies without being able to seek the advice and assistance of his colleagues.

VACANCIES

Vacancies for medical officers may occur at any time of the year, and are dealt with as circumstances require. The almost complete cessation of recruitment during the war period, coupled with the post-war expansion of staffs, particularly in the larger Colonies, resulted in an abnormally high rate of recruitment. The average for the six years, 1924 to 1929, was 104 vacancies per annum. In 1930 the number of vacancies fell to 77, due to the establishments of medical departments being almost at full strength. As a result of the general financial depression only 35 vacancies were filled in 1931, and the number was further reduced to 12, 22, and 31 in 1932, 1933, and 1934 respectively. For the present vacancies are likely to be limited in number. In normal circumstances vacancies occur most frequently and regularly in Tropical Africa and Malaya. In the Bahamas, Barbados, Bermuda, Ceylon, Jamaica, and Mauritius, junior posts are practically always filled by the appointment of qualified local candidates. The vacancies for which candidates are selected from outside the Service are those for ordinary medical officers. Appointments for specialists are almost invariably reserved for officers who are already in the Service, and who have shown outstanding merit in a particular branch of medicine or surgery. Under normal conditions about six vacancies were to be expected annually, usually in West Africa and in Malaya, for women medical officers.

QUALIFICATIONS

Applicants must be under 35 years of age, and preference is given to candidates under 30. For certain appointments candidates must be of European parentage.

Preference will be given to applicants who have held hospital or public health appointments or who have special knowledge of anæsthetics, radiology, surgery, medicine, ophthalmology, gynæcology and midwifery, diseases of the ear, nose, and throat, or venereal diseases. In the case of women medical officers experience in maternity and child welfare is almost essential.

Selected candidates will normally be required to undergo a course of instruction at the London School of Hygiene and Tropical Medicine or at the Liverpool School of Tropical Medicine or at Edinburgh University before taking up their appointments. The cost of tuition will be paid by the Government, but candidates must make their own arrangements for board and lodging. An allowance of £25 a month will be paid to them monthly in arrear while they are under instruction. Candidates who are successful in obtaining the diploma in tropical medicine and hygiene of London, Liverpool, or Edinburgh are granted a refund of their examination fees. If an officer has not taken a course of instruction in tropical medicine prior to appointment, he is usually required to take one during his first leave of absence and to obtain a satisfactory certificate before he can be confirmed in his appointment.

GENERAL CONDITIONS OF SERVICE

New entrants to the Service will be liable to transfer to any scheduled post therein, whether or not such transfer represents promotion, provided that:

(*a*) No officer whose first appointment is to an office in a Dependency in which he was ordinarily resident at the time of appointment shall be liable to be transferred to an office outside that Dependency unless and until he shall have accepted an office in another Dependency.

(*b*) No officer shall be transferred without his own consent to an office which in the opinion of the Secretary of State is of less value (due regard being had to climate and other circumstances) than that which he already holds.

Officers who do not hold scheduled posts are eligible to apply for transfer to such posts. Appointment confirmation, promotion, retirement, and transfer of Medical Officers will be governed by the directions of the Secretary of State.

No officer of the Service is entitled, as of right, to private practice, the Service being envisaged as essentially a Service of whole-time officials whose primary duty is to the State.

In view of the present financial stringency it has been found necessary in certain Colonial Administrations to impose a temporary levy on salaries. The actual value of an appointment is often much greater than is indicated by the salary alone. An applicant should take into consideration whether the post is pensionable; whether free quarters are provided; whether any special local allowances are payable; whether free passages are provided on first appointment and when proceeding on leave; and whether free or assisted passages are provided for the wives and children of married officers. If local income-tax exists in a colony it is much lower than that payable at home.

The majority of appointments are pensionable. Officers appointed to pensionable posts serve on probation in the first instance, the probationary period varying in different services—e.g., two years in East Africa, three years in West Africa. Some appointments are temporary, and service in these does not qualify for pension unless the appointment is subsequently made pensionable.

Information as to the conditions and cost of in the colonies, protectorates, and mandated ter is contained in a publication of that title (C No. 56), which may be obtained from H.M. Stat Office, price 3*s*. Further information as staffs, the climate, and local conditions will be in the Dominions Office and Colonial Offic Leaflets concerning nearly all the tropical dencies are issued for the use of intending settle others by the Oversea Settlement Depar Dominions Office, Caxton House, Tothill- London, S.W.1. A memorandum on Appointments issued by the Colonial Office sent without charge on application to the Dire Recruitment.

Applications for medical appointments i Colonial Service should be addressed to the Di of Recruitment (Colonial Service), Colonial 2, Richmond-terrace, Whitehall, London, For the present no candidate will be consider the Secretary of State for the Colonies who di —if of suitable age—serve in some branch Majesty's Forces during the Great War, unle reasons for not having done so are considered er satisfactory by the Secretary of State.

PARTICULAR CONDITIONS OF SERVICE

Tropical Africa

EAST AFRICA

Selected candidates are appointed as m officers on probation in the first instance fo years, at the end of which period their appoint are made permanent if their service has been factory, and a native language test has been p Later on a special course of study must be while on leave. Candidates can generally take wives with them on first appointment.

Officers are provided with quarters free of r the Government may provide temporary accom tion, or an allowance in lieu of quarters may be The salary of a medical or health officer is per annum, rising by annual increments of £ £840, and thence by increments of £40 to subject to an efficiency bar at £840. Senior me officers and senior health officers are pai the scale £1000 by annual increments of £5 £1100.

Officers appointed to any East African Depend excepting Northern Rhodesia are permitted to with gratuity, if they wish, instead of waiting to on pension, as follows: (*a*) after nine years' ser of which at least six must have been spent in Africa, £1000; (*b*) after twelve years' service, of w at least eight must have been spent in East A £1250. If an officer elects to retire with gratuit thereby forgoes all claim to pension.

The highest grades and salaries in the me departments are as follows:—

Kenya, Uganda, and Tanganyika Territor Director of Medical Services, £1500; Deputy Dire of Medical Services, £1200.

Nyasaland.—Director, £1300; Medical Ento logist, £1000–£50–£1100.

Zanzibar.—Director of Medical Services, £1 Resident Surgical Officer, £1000–£50–£1100.

Northern Rhodesia.— Director of Medical Serv £1300; Deputy Director of Medical Services, £1

There are also the following posts: med superintendent and principal of medical school, Mu Hospital (Uganda), £1150; sleeping sickness of (Tanganyika Territory), £1000–£50–£1100; se bacteriologists (Kenya and Uganda), £1000–£ £1100; pathologist (Zanzibar), £600–£1000. Ju surgical specialist (Kenya) and medical speci

(Tanganyika Territory), £600–£1000; Specialist Surgical Officer (Northern Rhodesia), £1100; pathologist (Nyasaland), £600–£920. Health officers are selected from the ranks of medical officers as occasion arises.

Leave of absence on full salary is granted in the normal case after a tour of resident service (varying from 12 to 15 months in Somaliland, 30 to 48 months in Kenya, 20 to 36 months in Northern Rhodesia, and 20 to 30 months in the other East African Dependencies, at the discretion of the Governor). Except in Kenya, Northern Rhodesia, and Somaliland the leave granted amounts to six days for each completed month of residence (or three days when for any reason the officer is not returning to East Africa), exclusive of the periods of the voyages to and from East Africa. Officers serving in certain stations in Nyasaland are allowed five or two and a half days' leave in respect of each month of service instead of six days or three days respectively.

Officers serving in Northern Rhodesia are allowed four days or two days. Officers serving in Somaliland are allowed seven or three and a half days after a tour of 12 to 15 months. Officers serving in Kenya are allowed three days for each month of residential service during their first two tours of service and four days for each month of residence during subsequent tours.

Free first-class passages are provided for the officer on first appointment and on leave, and in certain cases assistance towards family passages is given.

Pensions.—Officers on the pensionable establishment may retire on attaining the age of 55 years. Earlier retirement in the event of ill-health is also provided for. Pensions are calculated at the rate of one six-hundredth of pensionable emoluments—i.e., salary and value of free quarters—in respect of each month's pensionable service at the time of retirement, subject in certain cases to an average of emoluments for the last three years before retirement.

WEST AFRICA

Officers hold their appointments in the first instance on probation for three years from the date of their first arrival. After being placed on the permanent establishment this period is counted for pension. Officers are not allowed to take their wives and young children out with them without the sanction of the Governor. When, as is usually the case, an officer has obtained permission to be accompanied by his wife a grant of one-half the cost of his wife's passage to and from West Africa is made subject to certain conditions.

Leave.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service. Within the above limits, the actual length of each officer's tour will be at the discretion of the Governor. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months. In addition, local leave may be granted up to 27 days in any one tour.

The scale of salaries of the officers of the Medical Department, Nigeria, is as follows:—

Appointment.	Salary.	Remarks.
Director of Medical and Sanitary Service.	£1800	Duty allowance £360.
Deputy Director, Health Service.	£1500	Duty allowance £300.
Deputy Director of Medical Service.	£1500	Duty allowance £300.
Specialist Officers ..	£1300	Duty allowance £260. After five years' approved service £1400 with duty allowance £280.
Assistant Director of Medical Service.	£1300	Duty allowance £260.
Assistant Director of Health Service.		
Senior Health Officers..	£1050–£50–£1200	Duty allowance £210.
Senior Medical Officers	£1000–£50–£1150	Seniority allowance £100.
Deputy Director, Tsetse Investigation.	£800–£40–£960	Staff pay £150: Seniority allowance £72.
Senior Sleeping Sickness Officer.		
Research Medical Officer		
Superintendent, Dispensers' Training School.		
Pathologists	£660–£30–£720–£40–£960	—
Medical Officers of Health.		
Medical Officers ..		
Lady Medical Officers..		

The highest grades and salaries in the other West African medical departments are as follows:—

The Gambia.—Senior Medical Officer, £1000–£50–£1150 plus £150 staff pay.

Sierra Leone.—Director, Medical Services, £1400; Surgical Specialist, £1300; Assistant Director of Health Service, £1300.

The Gold Coast.—Director, Medical Services, £1600; Deputy Director of Medical Service, £1400; Deputy Director of Health Service, £1400; Specialist Officers, £1300.

The salary of a medical officer is at the rate of £660 a year, rising by annual increments of £30 to £720 a year. Then, if confirmed in the appointment, £720 a year, rising by annual increments of £40 to £960, with seniority allowance at the rate of £72 a year. Before passing £800, medical officers are required to take a special course of study for three months. If they obtain satisfactory certificates at the end of the course they draw their further increments up to £960 a year. A medical officer who has served for three years on the maximum salary of this scale (£960) without obtaining promotion is eligible, if recommended by the Governor, to be placed on the scale £1000–£50–£1150, with £100 seniority allowance (as for senior medical officers).

Research and Pathology.—There are a number of appointments for pathologists in Nigeria and the Gold Coast. The salary and other conditions attached to these posts are similar to those of medical officers of health.

African Medical Officers.—There are a number of Government appointments for African medical officers in the West African Colonies. These appointments carry a salary on the scales of £500–£25–£600 and £600–£30–£720. In addition, in Nigeria and on the Gold Coast, arrangements have been made for the employment of a few young African medical men temporarily on the hospital staffs, with a view to appointment to the Government service later, if suitable. In such cases a salary of £400 a year is paid.

Eastern Colonies and Protectorates

MALAYA

Medical officers are appointed on the following scale of salaries: £700, rising to £770 during three years' probation; then, if they are placed on the pensionable establishment, rising to £805, and thence by annual increments of £35 to £1120, with a strict efficiency bar at £840.

Above the concluding figure of £1120 there are certain higher appointments, as follows: director of medical services, Straits Settlements, £1890; director, Institute for Medical Research, Federated Malay States, and principal, King Edward VII. College of Medicine, Singapore, £1540 each; some posts at £1470; and some posts at £1190, rising annually by £42 to £1400. Salaries are paid in dollars at *2s. 4d.*

Information about general conditions in Malaya is obtainable from the Malayan Information Agency, 57, Charing Cross, London, S.W.1.

Leave.—Eight months' full-pay leave is normally granted: (*a*) after a tour of four years' resident service during the first eight years of resident service; (*b*) after a tour of three years' resident service during the next six years of resident service; (*c*) after a tour of two and a half years' resident service after 14 years' resident service. Additional leave on half-pay may be granted on special grounds. Officers are provided with free passages on first appointment for themselves and their families (i.e., wife and children) up to five persons, inclusive of the officer. On completion of each full tour, free return passages are given to all officers (with wife and children under the age of 10).

HONG-KONG

Officers are appointed on probation for three years. A diploma of public health is required for appointment as a health officer. The scale of salaries of the medical department is: director of medical and sanitary services, £1500–£50–£1800; deputy director £1300–£50–£1400; senior medical officer and senior health officer, £1200 – £40 – £1280; malariologist, bacteriologist, each £920–£40–£1280; port health officer and second port health officer, £860–£40 and one of £20 to £1280; health officers, £860–£40–£1220; assistant bacteriologist, radiologist, each £860–£40–£1220; medical officers, £700–£40–£1180. The currency of Hong-Kong is based on the silver dollar. For purposes of local payment salaries fixed in sterling are converted into dollars at the current rate of exchange. If furnished or unfurnished quarters are provided a rental of 7 per cent. or 6 per cent. on salary respectively is charged. In certain instances a rent allowance is paid instead.

West Indian Colonies

Jamaica.—District medical officers, if on a whole-time basis, draw £600–£25–£800 with travelling allowance and unfurnished quarters or an allowance in lieu. The public hospital, Kingston, has a staff of seven, the senior medical officer drawing £700–£50–£800. The chief post in the colony is that of superintending medical officer, £1000–£50–£1200. Whole-time officers are not allowed private practice. The age for voluntary retirement is 60. Pension is reckoned at the rate of 1-720th of pensionable emoluments for each month of service.

Trinidad and Tobago.—In Trinidad and Tobago Government medical officers receive salary at the rate of £400 per annum, rising by annual increments of £25 to £600. An officer appointed to a district receives, in addition to his salary, a travelling allowance varying from £100 per annum in a normal district to £150 per annum, and is allowed private practice, for which there is good scope. Officers employed in institution work receive a duty allowance varying from £50 to £300. Medical officers having completed 10 years' resident service are pensionable at the age of 55.

Windward Islands (Grenada, St. Lucia, St. Vincent). The senior medical officer, Grenada, receives £750, The senior medical officer, St. Lucia, receives £650, plus transport and subsistence allowances; the post is pensionable, but private practice is not allowed except as a consultant. The senior medical officer, St. Vincent, receives £500–£600, with free quarters valued at £40. Most of the remaining appointments are district appointments with the right to private practice attached; the salaries paid by Government are, in Grenada, on the scale £500–£600, in St. Lucia, £400–£500, in St. Vincent, £400–£450. The Governor has the power to transfer a medical officer from one island to another. Appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The appointments are similar in number and character to those in the Windward Islands, and are pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary of £340, and is later appointed to a definite district at a salary varying from £340 to £400–£25–£450, and the Governor decides as to the district which is to be allotted to him. He is liable to be transferred at the Governor's discretion to any medical district in the Leeward Islands. The medical officers, except in St. Christopher and Nevis, receive fees for successful vaccinations, post-mortem examinations, evidence at courts of justice, and certificates of lunacy. They are also, as a rule, allowed private practice.

British Guiana.—There are the following appointments in the medical service of the colony: surgeon-general, £1000–£1200 per annum, with consulting practice; resident surgeon and surgeon specialist, Georgetown, £1100; ophthalmologist, £700; medical superintendent, Leprosy Hospital, £700; 27 medical officers, £500–£25–£700. Most of the senior posts in institutions carry duty allowances (varying from £50 to £300 per annum) and quarters.

British Honduras.—The salary of an assistant medical officer is £500–£25–£650. The senior medical officer draws £1000, paid in dollars. Unless they already possess a diploma of public health, medical officers are liable to be required, before they join the colony, to undergo a course of instruction at a laboratory of public health or analogous institution. The appointments are pensionable.

In British Guiana, Jamaica, and Trinidad officers are allowed to accumulate full-pay leave (at the rate of six weeks for each year's service) up to six months, and no leave of absence may (except in very special circumstances) exceed six months in all unless the officer has served for five years or more without leave, in which case two months on half-pay may be taken in addition to six months' full-pay leave.

Western Pacific

Fiji.—The chief medical officer receives £1000–£50–£1100, with free unfurnished quarters; the medical superintendent, Colonial War Memorial Hospital, £800–£25–£1000, and free quarters; the medical superintendent, Leper Asylum, £500–£25–£725, with completely furnished quarters and one servant; the medical officer of health, £750–£25–£900, no quarters provided. District medical officers receive £500–£25–£725, with partly furnished quarters or £50 house allowance (at the option of the Government). In certain districts horse allowances or car allowances are granted. In others a medical officer is provided with a launch or boat. District medical officers are allowed private practice on the understanding that their official duties are not neglected. In some districts the medical officer is also district commissioner and receives an additional allowance of from £175 to £235 and free partly furnished quarters. In most districts there is private practice, the value of which has been estimated at from £100 to £600 a year.

Western Pacific.—The staff in the British Solomons Islands Protectorate consists of a senior medical officer, £700–£50–£900, with partly furnished quarters and a local allowance of £50; one travelling medical officer, £550–£25–£650, with partly furnished quarters, a local allowance of £50, and a consolidated travelling allowance of £200.

In the *Gilbert and Ellice Islands Colony* there is a senior medical officer, £650–£25–£750, and an allowance of £100 to compensate for absence of private practice; partly furnished quarters are provided. One medical officer at £600–£25–£650, one at £700–£25–£800. Both these officers receive an allowance of £100 to compensate for absence of private practice; partly furnished quarters are provided.

Mediterranean Colonies

Cyprus.—There is a senior medical officer, £1000–£25–£1200; district medical officers, £400–£20–£600, one of whom is allowed full private practice, and another consulting practice. The surgeon specialist, £600–£25–£750, is allowed consulting practice.

Gibraltar.—The senior medical officer receives £1000. There are 2 medical officers, one at £600–£30–£720 and one at £500–£25–£600–£50–£700. Both are allowed private consulting practice only. Free unfurnished quarters are provided.

Island Group

Falkland Islands.—The senior medical officer is paid at the rate of £800 per annum, with free furnished quarters and £200 in lieu of private practice. Two medical officers receive £700–£25–£800 and £600–£20–£700 respectively, with quarters. Private practice is not allowed.

Seychelles.—The senior medical officer receives £525 and the resident surgeon £450 per annum, with quarters. There are three assistant medical officers, one receiving £450, the other £225 per annum, paid in rupees. Private practice is allowed.

St. Helena.—The senior medical officer receives £550, with fees estimated at £20, and £30 transport allowance. Private practice is allowed. There is a second medical officer at £500.

Middle East

Palestine.—The grades and salaries of higher appointments in the department of health are: director of medical services, £1200, plus £200 expatriation allowance. Deputy director, £850–£50–£1100, plus £150 expatriation allowance; specialist surgeon (who is allowed a certain amount of private practice), and senior medical officers, £800–£25–£1000, plus £100 expatriation allowance. Government analyst, £300–£25–£800, plus £100 expatriation allowance. Payment is in Palestinian pounds, now equal to sterling. The remainder of the staff is recruited locally. Three months' leave with full pay can be taken every two years. Most of the senior appointments have been or will be made pensionable.

APPOINTMENTS NOT WITHIN THE COLONIAL SERVICE

Appointments in the self-governing Dominions and the territories administered by them—viz., Canada, the Commonwealth of Australia (including Papua, Norfolk Island, and the mandated territory of New Guinea), New Zealand (including the Cook Islands and the mandated territory of Samoa), the Union of South Africa (including the mandated territory of South West Africa), the Irish Free State, and Newfoundland—are entirely under the control of the respective Dominion Governments. For information with regard to them application should be made to the High Commissioners or Agents-General in London.

Sudan Medical Service

This service is responsible for carrying out civil and military medical and public health duties in the Sudan.

The staff consists of: (*a*) A director. (*b*) A senior physician and a senior surgeon to the Khartoum Civil Hospital. (*c*) An assistant director. (*d*) Medical officer of health, Khartoum Province. (*e*) 34 British "senior medical inspectors" and "medical inspectors" whose pay commences at £E.720 and rises, subject to the recommendation of the director, by five biennial increases to £E.1080, and after 13 years' service to £E.1200. All rates of pay are subject to an abatement of 7½%. The senior medical inspectors are eligible, by selection, for the senior posts. All medical inspectors are appointed, in the first place, on probation for two years, and if at the end of that time they are accepted for permanent service under the Sudan Government, the first increase of pay is subject to their passing an examination in Arabic.

In addition to the above there are (*f*) a number of medical officers trained at one of the Syrian medical schools, and (*g*) Sudanese medical officers trained at the school of medicine at Khartoum. There are several native (*h*) assistant medical officers, who have been given a purely practical training in one of the larger hospitals in the Sudan.

Amongst the attractions of the service are: The great variety of the work met with among many different races of the Sudan; *leave* of 90 days, generally granted every year after the first 18 months of service; *study-leave*, which may be given for some definite purpose. The pension for medical inspectors who retire after 20 years' service is not less than £E.500 a year. If, however, he serves for a longer period, or is appointed to one of the higher posts, he will receive a larger pension. Private practice is allowed, but is limited to a few of the larger towns, and may be carried on so long as it does not interfere, in any way, with official duties. These duties include acting as consultant to the principal hospitals and the supervision of medical and public health work, the inspection of schools, the examination of candidates for Government service and pension, and the training of assistant medical officers and native sanitary overseers. The Khartoum Medical School is staffed mainly by members of the medical service, who receive additional remuneration for their work as teachers. A registrar of the medical school is also selected from the service, who receives £E.250 a year extra pay.

Inquiries for further information should be made to the Deans of the Principal Medical Schools, and to Dr. Hodson, 69, Harley-street, W.

Southern Rhodesia.—Appointments are under the control of the Government of Southern Rhodesia. Information from the High Commissioner, Crown House, Aldwych, London, W.C.2.

Malta.—Inquiries should be addressed to the Secretary to Government, Valetta, Malta.

North Borneo.—Application to the British North Borneo Company, Staple Hall, Stonehouse Court, Bishopsgate, E.C.3.

Sarawak.—Appointments are in the hands of H.H. the Rajah. Information from the Sarawak Government Offices, 2 Millbank, London, S.W.1.

Basutoland, Swaziland, and the Bechuanaland Protectorate.—Appointments are made upon the recommendation of the resident commissioners, subject to the approval of the High Commissioner for Basutoland, the Bechuanaland Protectorate, and Swaziland, and confirmation by the Secretary of State for Dominion Affairs. These appointments are usually filled by the selection of local candidates.

Shanghai Municipal Appointments.—Inquiries regarding appointments under the Shanghai Municipality, including appointments in the Shanghai Police Force, should be addressed to Messrs. J. Pook and Co., 68, Fenchurch-street, London, E.C.3.

Chinese Maritime Customs.—Inquiries regarding appointments should be addressed to the Inspector-General of the Chinese Maritime Customs, 26, Old Queen-street, London, S.W.1.

Consular Appointments.—Application for appointments of a Consular nature should be addressed to the Foreign Office, London, S.W.1.

Trade Commissionerships.—Applications for appointment as trade commissioner in the colonies and elsewhere should be addressed to the Department of Overseas Trade (Development and Intelligence), 35, Old Queen-street, London, S.W.1.

WOMEN'S MEDICAL SERVICE FOR INDIA

AMONG careers open to medical women abroad the Women's Medical Service for India deserves honourable mention. The Service is open to fully qualified medical women of British or Indian nationality, and with the present amount of Government subsidy the number of medical officers is limited to 44. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. For a further period they are appointed to act temporarily for medical women on furlough. They are then definitely appointed to the charge of hospitals. Private practice is allowed, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Excellent opportunities for surgery—especially gynæcology—are found in the Women's Medical Service. Opportunities are likely to open in the future in connexion with maternity and child welfare.

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses for about Rs.300 per mensem, leaving the remainder of her salary for dress and personal expenses. To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills.

Rates of pay are as follows:—

Years of service.		Overseas allowance per mensem.		Salary per mensem.		English equivalent* per annum.
1 to 3	....	Rs.100	....	Rs.450	....	£440
4 to 6	....	„	....	Rs.500	....	£480
7 to 9	....	„	....	Rs.550	....	£520
10 to 12	....	„	....	Rs.600	....	£560
13 to 15	....	Rs.150	....	Rs.650	....	£600
16 to 18	....	„	....	Rs.700	....	£640
19 to 21	....	„	....	Rs.750	....	£680
22 to 24	....	„	....	Rs.800	....	£720
over 24	....	„	....	Rs.850	....	£760

* At rupee value 1s. 4*d*.

Furnished quarters are provided, representing an additional Rs.150 per mensem.

Leave on average pay is earned at the rate of 2/11ths of the period spent on duty.

Study-leave is granted to the extent of 12 months in the total service and will not be granted more than twice in the course of an officer's service. During study-leave an officer draws half average pay, with a study allowance at the rate of 12*s*. a day during the course of study. Officers of European domicile are entitled to four free return first-class passages from a port in India to a port outside India in their whole service. The first passage is not granted until after the expiry of four years' approved service, and thereafter passages may be granted at intervals of not less than four years. There is a Provident Fund to which members of the Service contribute 10 per cent. of their pay. The Service contributes another 10 per cent., which accumulates at interest and is repaid on retirement.

Admission to the Service is made by selection in India and England—preference being given to those with Indian experience. Vacancies are few. Candidates in the United Kingdom should apply to the Hon. Secretary, United Kingdom Branch of the Countess of Dufferin's Fund, care of India Office, Whitehall, London. Candidates in India should apply to the Chief Medical Officer, Women's Medical Service, Countess of Dufferin's Fund, Simla and Delhi.

THE L.C.C. HOSPITAL SERVICE

THE hospital service of the London County Council provides opportunities for valuable experience for medical graduates who intend to be general practitioners or consultants, as well as for those who intend to make the public health service their career. Under the operation of the Local Government Act, 1929, the L.C.C. became responsible for the management of 74 hospitals (excluding mental hospitals)—namely, 28 general hospitals, 17 fever and other infectious diseases hospitals, 6 tuberculosis hospitals and sanatoria, 9 hospitals and convalescent homes for children, 12 hospitals and institutions for chronic sick patients, and 2 colonies for sane epileptics; 2 convalescent hospitals and one hospital for surgical tuberculosis in children were subsequently acquired, making a total of 77.

Medical superintendents of the hospitals, who are expected to be experienced hospital administrators, receive £900 to £1650 a year, corresponding to hospitals varying in accommodation from 160 to 1300 patients. In addition, medical superintendents are provided with an unfurnished house or quarters, with payment by the Council of local and water rates.

The subordinate staff is classified thus:

Grade.	Scale of annual salary.
Deputy Medical Superintendent, Grade I.	£650–£50–£800
Deputy Medical Superintendent, Grade II.	£600–£30–£750
Senior Assistant Medical Officer, Grade I. .	£550–£25–£650
Senior Assistant Medical Officer, Grade II.	£500–£25–£600
Assistant Medical Officer, Grade I. .. rising to £150 if placed on promotion list.	£350–£25–£425
Assistant Medical Officer, Grade II. ..	£250 (fixed)

In addition all these officers are provided with board, lodging, and washing. All the positions mentioned involve full-time duties, and it is a condition of service that such officers shall not undertake any other paid employment. The staffing provides, where necessary, for house physicians or house surgeons, remunerated at the rate of £120 a year, with residence, and for clinical assistants, who are non-resident and receive £150 a year, with meals when on duty. These officers are not employed in a whole-time capacity and are granted adequate leisure for study.

Deputy medical superintendents and senior assistant medical officers who occupy unfurnished houses or quarters (married quarters) in the hospitals are paid the following salaries in lieu of those set out above. The unfurnished houses or quarters are provided free of charge, the Council also paying all local and water rates:—

Grade.	Scale of annual salary.
Deputy Medical Superintendent, Grade I. ..	£700–£50–£850
Deputy Medical Superintendent, Grade II. ..	£650–£30–£800
Senior Assistant Medical Officer, Grade I. ..	£600–£25–£700
Senior Assistant Medical Officer, Grade II. ..	£550–£25–£650

Vacancies in the higher grades are filled, as far as possible, by promotion from the existing staff. All full-time medical staff are allowed liberal annual leave with pay, and full pay during sickness for a reasonable period. For subordinate staff, the extent and fluidity of the hospital service provides unique opportunities for a variety of experience, and facilities exist for specialisation and for officers to follow courses of study outside the service with a view to improving their professional qualifications.

During the past year 155 vacancies have been filled, including 2 positions as medical superintendents, 2 as deputy medical superintendents, 24 as senior assistant medical officers, 98 as assistant medical officers, 28 as house surgeons, house physicians, or clinical assistants, and 1 as medical officer of a children's hospital. During the year also a large number—more than 200—of part-time consultants and specialists have been appointed to the various units and groups of these hospitals. These appointments, which vary from 1 to 6 sessions a week, include physicians, surgeons, obstetricians and gynæcologists, anæsthetists, pædiatrists, neurologists, orthopædists, radiologists, dermatologists, ophthalmologists, urologists, and specialists in ear, nose, and throat.

In addition, other part-time consultants and specialists were employed for special purposes—e.g., venereal diseases specialists, plastic and thoracic surgeons, &c.—and the services were available of a tuberculosis officer at each general hospital having a tuberculosis ward.

Post-graduate facilities.—These are as follow :—

Hammersmith Hospital.—In connexion with the British Postgraduate Medical School, of which a full account is given on pp. 477 and 478.

St. Alfege's Hospital: Facilities are afforded to the Final Fellowship Class of Guy's Hospital to examine selected cases. The demonstration is undertaken by a surgical tutor of the class.

St. Andrew's Hospital: Consultant surgeon holds weekly classes for two periods of about 10 weeks previous to Final F.R.C.S. examinations.

St. James' Hospital: The South-West London Post-Graduate Association has its headquarters at this hospital where three sessions of lectures are given annually—Autumn, Lent, and Summer.

Post-graduate courses.—Courses of instruction in hospital administration for candidates for the Diploma in Public Health are held at the North-Western Hospital and at the Brook Hospital.

Special Units.—Special departments for the treatment of various diseases are available in the general hospitals and include—e.g., special units at St. James' Hospital for the treatment of cases by plastic surgery and thoracic surgery; at St. Andrew's Hospital for treatment by thoracic surgery; at Lambeth Hospital for the treatment of patients by radium and deep X ray therapy; at New End Hospital for treatment of patients suffering from thyroid disease; at St. Stephen's Hospital, rheumatic cases; at St. Mary, Islington, Hospital for the treatment of urological disease; and at St. Peter's Hospital for the treatment of diabetes.

Under-graduate facilities.—The following general hospitals are affiliated to medical schools for the purpose of clinical teaching :—

Council's Hospital.	*Medical School.*
St. Charles'	Charing Cross Hospital.
St. Alfege's St. Olave's Lewisham	Guy's Hospital.
St. Giles' Dulwich	King's College Hospital.
Archway	Middlesex Hospital.
St. Mary, Islington Highgate	Royal Free Hospital.
St. Pancras Hackney Bethnal Green	St. Barthlolmew's Hospital.
St. Mary Abbots	St. George's Hospital.
Paddington	St. Mary's Hospital.
Lambeth	St. Thomas's Hospital.
St. Mary, Islington	University College Hospital.
St. Stephen's	Westminster Hospital.

In addition, under-graduates from six medical schools are accepted as resident students at certain general hospitals for instruction in obstetrics.

The fever hospitals provide facilities for under-graduate instruction in infectious disease.

Small-pox.—Provision is also made for demonstrations in the diagnosis and treatment of small-pox for both under-graduate and post-graduate students.

Recognition for examinations.—The majority of the general hospitals are recognised for qualifications for candidature in branch 1 of the University of London M.D. Examination. Ten of the general hospitals are recognised by the British College of Obstetricians and Gynæcologists for candidature for their Diploma and membership.

SPECIAL DIPLOMAS

DIPLOMA IN PUBLIC HEALTH

The following epitomises the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, hygiene, or State medicine, as the diploma is variously called. Resolutions and rules, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all branches of study which concern the public health," have been adopted at various times by the General Medical Council, by whom the diploma is registrable and whose rules become binding on the educational bodies concerned.

London School of Hygiene and Tropical Medicine.—The course of study for the Diploma in Public Health will commence on Oct. 1st in the premises in Keppel-street (Gower-street), the gift of the Rockefeller Foundation, which has excellent laboratories and research rooms, a fine lecture theatre and classrooms, library, and museum. The course, which will extend over a period of nine months for those prepared to give whole-time study, is designed in compliance with the requirements of the General Medical Council, and will enable students, who wish to do so, to proceed to the academic Diploma in Public Health of London University. The curriculum has been planned on very practical lines, and includes, in addition to work with medical officers of health in selected areas, a large number of visits to places of public health interest. The course also includes provision for the necessary instruction in infectious disease and hospital management, lectures and demonstrations on physiology applied to hygiene and industry, medical industrial psychology, and sanitary engineering. A series of lectures by authorities on special subjects are open to members of the medical profession as well as to students of the School. The London County Council, the City of London, and various other bodies have placed their resources at the disposal of the School for teaching purposes.

Royal Institute of Public Health and Institute of Hygiene.—Facilities are offered here (23, Queen-square, London, W.C.1) for students training for the D.P.H. There are well-equipped laboratories where practical instruction is given in chemistry, bacteriology, immunology, and public health subjects, and analyses are undertaken, both chemical and bacteriological, of milk, water, and sewage effluents, providing excellent teaching material.

The Course of Study

A diploma of D.P.H. is granted by the Universities of London, Durham, Birmingham, Wales, Aberdeen, Edinburgh, Glasgow, St. Andrews, Dublin (Trinity College), and the English, Scottish, and Irish Conjoint Boards. The course of study is fairly identical in all the centres, as would be expected for a registrable title. It extends over twelve calendar months, or an academic year of full-time study covering a period of not less than nine calendar months, subsequent to the attainment of a registrable degree or diploma. At several of the universities it is stated that a certain part of the course must be pursued locally, while at others there is a proviso that evidence shall be produced of attendance at courses of institutions approved by the university or licensing body; such particular instruction can be obtained from the centres on application.

At all the centres the course is divided into two Parts and candidates must pass Part I. before proceeding to Part II.

Part I.—The duration of training is about five months, some of the centres stating the period as not less than 280 hours. The usual division of subjects is as follows: Candidates will be admissible to examination on producing evidence of having attended during not less than 280 hours at a recognised institution, practical instruction in (*a*) bacteriology and parasitology (including immunology, serology and medical entomology), especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man; (*b*) chemistry, physics, radiology, and electrology in relation to public health; (*c*) physiology and biochemistry in their application to nutrition and hygiene; (*d*) meteorology and climatology in relation to public health. The examinations are held at most centres twice a year, and the candidates must pass in all the specified subjects at one time.

Part II.—The duration of training consists of instruction during not less than 120 hours at a recognised institution in the following subjects: (*a*) the principles of public health and sanitation; (*b*) epidemiology and vital statistics; (*c*) sanitary law and administration; (*d*) sanitary construction and planning. A second part of the examination includes practical examinations in infectious diseases, food inspection and inspection of premises, dwelling-houses, schools, factories, workshops, bakeries, dairies and cowsheds.

While Part II. of the examination entails the acquirement of similar knowledge at all the centres the details of the training differ at certain points—e.g., where the candidate is using the examination also for obtaining a university degree in public health. Intending candidates must, therefore, apply to the selected centre for information.

DIPLOMA IN TROPICAL MEDICINE

Although a qualification in tropical medicine has not been made registrable by statute, a diploma is regarded as indispensable for appointments in the Colonial Medical Service and similar positions abroad. Systematic instruction for these diplomas is given at the Incorporated Liverpool School of Tropical Medicine (founded in 1898) and at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, London, W.C.; while the University of Edinburgh and the English Conjoint Board grant a diploma.

London School of Hygiene and Tropical Medicine

The course of instruction in tropical medicine and hygiene is divided into two parts: Section A, a three months' course in clinical and laboratory instruction, and Section B, a two months' course in tropical hygiene. Each section can be taken independently of the other, and the examinations of the Conjoint Board follow closely upon the end of the corresponding course of study. This revised course is recognised by the University of London as a course for associate students. The dates of the courses for the session 1935–36 are as follows:—

Section A (Clinical and Laboratory Instruction).—Oct. 1st to Dec. 20th, 1935; Jan. 6th to March 27th, 1936; April 6th to June 26th, 1936.

Section B (Tropical Hygiene).—Jan. 20th to March 20th, 1936; April 20th to June 19th, 1936.

The course of instruction under Section A includes clinical tropical medicine, applied pathology, medical zoology, and elementary bacteriology. Section B* comprises instruction in tropical hygiene, including, in relation to hygiene, bacteriology, medical zoology, anthropology, and vital and medical statistics. Section A is so arranged, in four self-contained groups or blocks, as to allow of the admission of a student at the beginning of any block of work, other than bacteriology, subject to a place in the laboratory being available. Accordingly, applications can be received for admission to the classes in Protozoology and Hæmatology (approximately four weeks), or in Helminthology (approximately four weeks), or in Entomology (approximately three weeks), with, in each case, if the student so wishes, the corresponding clinical demonstrations, instruction in applied pathology, and special lectures. Further, students wishing to attend the clinics and clinical lectures only can do so for any period of four weeks during the course. The instruction in the Division of Clinical Tropical Medicine is given by the medical staff of the Hospital for Tropical Diseases and by visiting lecturers. In this way the resources of the hospitals of the Seamen's Hospital Society at Gordon-street, at the Albert Docks, and elsewhere, become available for the clinical instruction of the students at the School.

Liverpool School of Tropical Medicine

The Liverpool University Diploma of Tropical Medicine (D.T.M.) is open only to those who possess a qualification to practise medicine recognised by the university, and who have been through a full course of instruction at this school. The subjects of examination are (*a*) Parasitology; (*b*) Entomology; (*c*) Tropical Medicine, including Ætiology, Symptoms, Pathology, Diagnosis, and Treatment of Tropical Diseases. The course consists entirely of Practical and Clinical work, given at the Laboratory at the University, and at a recognised hospital in which beds are specially reserved for Tropical Diseases. Applications should be made to the Dean of the Medical Faculty, University of Liverpool.

The University also grants a Diploma in Tropical Hygiene (D.T.H.). The subjects of examination are (*a*) Tropical Hygiene (including Sanitary Engineering, Vital Statistics and Epidemiology, and Applied Parasitology and Entomology; (*b*) Practical Sanitation; (*c*) Bacteriology; (*d*) Chemistry (including Meteorology and Climatology). Accommodation for research work is to be had at the University Laboratory. The Mary Kingsley Medal is awarded by the school for distinguished work in connexion with Tropical Medicine.

University of Edinburgh

Candidates for the Diploma in Tropical Medicine and Hygiene must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body, or of other universities or medical schools specially recognised. The course of instruction, comprising a primary and a second course, is given during the autumn and spring terms, October to March, and includes Tropical Hygiene, Bacteriology, Entomology and Parasitology, Diseases of Tropical Climates (systematic and clinical), Tuberculosis, and Venereal Diseases. Provision is made in the University for instruction in all subjects.

The examinations are written, oral, and practical, and are held at the end of the courses: Part I in December, and Part II in March. Candidates are required on the first occasion of presenting themselves for examination in either part to appear for all the subjects of that part. Candidates who fail to pass the entire examination in either part within a period of 12 months after first appearance are required to reappear for all the subjects. The University is included in the list of institutions in which courses of instruction in Tropical Medicine may be taken by officers on appointment to the Colonial Medical Services or during study-leave. Full particulars can be obtained from the Dean of the Faculty of Medicine.

English Conjoint Board

The Board conducts an Examination three times a year for the D.T.M. & H. granted by the Royal Colleges—namely, in January, April, and July. The Examination comprises written, oral, and practical examinations in the following subjects: *Section A*, Clinical Tropical Medicine and Surgery; applied Pathology, Zoology, and Elementary Bacteriology.

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* The Andrew Balfour Memorial Fund provides two studentships in the year, which are available in the form of free tuition in Section B. of the Course.

Section B, Tropical Hygiene, including Epidemiology, Medical Zoology, and Bacteriology in relation to Hygiene. Candidates may enter for either or both Sections of the Examination provided that Section A is taken before Section B. (Candidates who are unsuccessful in Section A will not be debarred from presenting themselves for Section B.) Candidates must give 14 days' notice, in writing, to the Secretary at the Examination Hall, 8–11, Queen-square, London, W.C.1, and produce at the same time the necessary certificates of study (after Dec. 18th, 21 days' notice will be required). Candidates must produce evidence of being in possession of a registrable qualification in Medicine, Surgery, and Midwifery, and of having attended subsequently to obtaining such registrable qualification :—(i) *for admission to Section A:* Practical instruction in Pathology, Protozoology, Helminthology, Entomology, and Bacteriology in an Institution recognised for this purpose, together with the clinical practice of a hospital recognised for the study of Tropical Diseases, during not less than three months; (ii) *for admission to Section B:* Instruction in Tropical Hygiene and Sanitation in an Institution recognised for this purpose during a further period of not less than two months. Graduates (M.B., B.S., or M.D.) in Medicine and Surgery of Indian, Colonial, and foreign Universities recognised by the Examining Board in England, whose degrees are not registrable in this country, may enter for the Examination for the Diploma in Tropical Medicine and Hygiene on fulfilling the conditions in regard to study. These conditions may be modified at the discretion of the Committee of Management in the case of a candidate (*a*) who has been employed in foreign (in the case of Naval Medical Officers, one or more commissions abroad must have been held) or Colonial Medical Service, (*b*) who has been engaged in professional work in tropical countries, (*c*) who produces evidence of having been engaged in original investigations in Tropical Medicine or Hygiene. Further particulars from the Secretary, Examination Hall, Queen-square, London, W.C.1.

DIPLOMA IN PSYCHOLOGICAL MEDICINE

The Universities of London, Durham, Leeds, Manchester, Edinburgh, Dublin (Trinity College), Ireland (National University), and the English Conjoint Board grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses; the details on these points can be obtained from the various examination bodies.

University of London

In London, courses of instruction for the Diploma in Psychological Medicine are given annually at the Maudsley Hospital, Denmark Hill, which is a school of the University of London. The course consists of two parts, commencing in January, and is adapted for the diploma of the Conjoint Board also. Comprehensive courses of instruction in the psychoneuroses, child disorders and delinquency are given at the Institute of Medical Psychology (see p. 536) which is now recognised as a teaching centre for the diploma.

Maudsley Hospital.—Appointments as clinical assistants are obtainable at the Maudsley Hospital. The holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. The appointments and other facilities for clinical experience are open to qualified medical practitioners apart from the courses of instruction. A course for the Diploma in Psychological Medicine is held annually from January to June at the Central Pathological Laboratory of the London County Mental Hospitals, which is situated in the Maudsley Hospital. Facilities and grants-in-aid are given for research work in psychiatry and allied subjects at the Laboratory. Inquiries as to lectures should be addressed to the Director of the Medical School, Central Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E.; and as to clinical facilities to the Medical Superintendent at the same address.

Bethlem Royal Hospital.—A course of lectures and practical instruction for the Diploma in Psychological Medicine, granted by the various universities and the Conjoint Board, is held at Bethlem Royal Hospital, Monks Orchard, Eden Park, Beckenham, twice annually, during the spring and autumn when possible. Part A or Part B, however, may be taken separately. In addition to the above, clinical instruction in Psychological Medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11 A.M. A reduction is made to those who attend the Diploma Course. House physicians are appointed at Bethlem Royal Hospital for a term of six months, which may be extended. These appointments are made at the beginning of February, May, August, and November in each year, and the vacancies are advertised in the medical papers. Apartments, complete board, attendance, and laundry are provided, and a salary at the rate of £150 per annum for the first three months, rising, if commendable service be given, to the rate of £200 per annum for the second period of three months. Clinical assistants are often appointed from time to time for periods of three months or longer. These are non-salaried and non-resident posts, but partial board is provided. The Physician-Superintendent, Bethlem Royal Hospital, Monks Orchard, Eden Park, Beckenham, will supply further particulars; the courses have not yet been arranged.

University of Durham

The university grants a diploma in psychiatry, and at the College of Medicine there is a department of instruction in psychological medicine. The candidate must be a registered medical practitioner, and subsequent to qualification have followed instructions on anatomy and physiology of the brain and nervous system. The examination is divided into two parts, Part I. dealing with anatomy, physiology, pathology, and bacteriology; Part II. with psychology and experimental psychology. Candidates may present themselves for the whole examination or for either part separately. The course of training is very detailed, post-mortem technique being the subject of a series of sessions, the same holding good for psychiatry and experimental psychology.

University of Leeds

The university grants a diploma in psychological medicine to graduates in medicine of at least one year's standing, who can prove that they have received systematic instruction on the normal and morbid anatomy of the brain and have held an appointment in a mental hospital. The examination is divided into three parts: Part I. deals with general psychology and the structural development and physiology of the nervous system; Part II. with the pathology of that system; and Part III. with clinical psychiatry, the administration of mental hospitals, and the medico-legal aspects of insanity. Candidates may present themselves for the three parts simultaneously or separately; they may submit a thesis or published work which, if approved, will gain certain exemptions.

University of Manchester

The university grants a diploma in psychological medicine to graduates of at least one year's standing. The examination is held in two parts. Before presenting themselves for Part I. candidates must, subsequent to qualification, have attended approved courses in the structure of the nervous system and in experimental psychology. Before presenting themselves for Part II. they must produce evidence of having gone through an approved course of instruction in the pathology of the nervous system and in clinical neurology, and of having attended demonstrations in psychological medicine, and received clinical instruction, either as residents or as daily attendants, at an approved hospital for mental diseases. The course extends over a period of three university terms, two of which must be taken in the university, and candidates may present themselves for both parts simultaneously or each separately.

University of Edinburgh

Candidates for the Diploma in Psychiatry must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body, or of other universities or medical schools specially recognised. The course for the Diploma extends over one term and is given from January to March. Candidates are required subsequent to the date of graduation or obtaining a recognised qualification to have held (*a*) a resident appointment for one year in a hospital for mental disorders approved by the Faculty of Medicine, or alternatively (*b*) a six months' appointment as defined in (*a*) and six months' practical study of nervous diseases in a special or general hospital approved by the Faculty of Medicine. There are two examinations for the Diploma both of which are held in March. Part I. comprises: 1. Anatomy of the Nervous System; 2. Physiology of the Nervous System; 3. Psychology and Experimental Psychology. Part II. comprises: 1. Neuropathology; 2. Psychiatry and Clinical Psychiatry; 3. Clinical Neurology; Candidates who have held an asylum appointment for a period of five years or more may be exempted from the course of study in one or more subjects of the curriculum. Full particulars can be obtained from the Dean of the Faculty of Medicine.

University of Dublin (Trinity College)

A post-graduate diploma in Psychological Medicine is conferred upon registered medical practitioners who have held a resident medical appointment at a recognised institution for the treatment of Mental Diseases for 12 months, or who have held such an appointment for six months and have attended clinical instruction at an approved institution for six months. Candidates must also attend special courses of instruction and pass a special examination. Details can be obtained from the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland

This University confers a diploma in Psychological Medicine. The diploma may be conferred on registered medical practitioners who although they may not have matriculated at the University shall have completed the prescribed course of study. A certificate of post-graduate work will be required from the candidates, either in the study of mental disease or as medical assistant in an asylum. Application should be made to the Registrars of the Constituent Colleges, University College, Dublin, University College, Cork, and University College, Galway, for all information.

DIPLOMA IN OPHTHALMIC MEDICINE

Special diplomas in ophthalmic medicine and surgery are issued by two examining bodies.

University of Oxford

The diploma in ophthalmology (D.O.) is granted to registered medical practitioners after passing an examination, held annually in June, which is open to candidates who have pursued at Oxford a course of study in ophthalmology over a period of at least two months and who have attended a 12 months' course of clinical ophthalmology at a recognised hospital. Further information regarding these requirements may be obtained from the Dean of the Medical School.

English Conjoint Board

The Conjoint Board grants the D.O.M.S. after an examination held in two parts, twice yearly in February and July. Part I. comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics. Part II. comprises optical defects, ophthalmic medicine and surgery, and pathology with special reference to ophthalmology. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of a year of special study of ophthalmology after obtaining a recognised qualification.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY

University of Cambridge

Before admission to any course for the Diploma a candidate shall produce evidence that he holds a medical qualification approved by the committee and also satisfy the committee that he has had sufficient post-graduate clinical experience. The next course, which begins on Oct. 2nd, 1935, occupies nine months. The first four months, which can be spent either in Cambridge or in London, are occupied with (*a*) lectures and practical work in Physics, in preparation for the examination for Part I. in February, (*b*) an introductory course of clinical instruction in Radiology and Electrology, (*c*) a course of instruction in Pathology in relation to Radiology and Electrology. The next three months must be spent in London, and are occupied with (*a*) lectures and demonstrations in Radiology and Electrology (including Radium Therapy) organised by the British Institute of Radiology, (*b*) clinical instruction in the Radiological Department of a hospital approved by the committee. During the final two months of the course a candidate must hold a clinical clerkship or similar appointment in the radiological department of a hospital approved by the committee. This part of the course may be done in London, or elsewhere. The examination for Part II. will be held in July. Further particulars as to courses and examinations may be obtained from Mr. G. Stead, M.A., Secretary for the Diploma, Cavendish Laboratory, Cambridge, or the General Secretary, British Institute of Radiology, 32, Welbeck-street, W.1.

University of London

The course for the post-graduate diploma in Medical Radiology extends over one academic year, and is open to registered medical practitioners and graduates in medicine of this or any other approved University. The subjects are: Part I., Physics and Electro-technology. Part II., (*a*) Radiology and Radio-diagnosis; (*b*) Radiotherapy. The examination is held in March and December (Part I.), and in June and December (Part II.). Particulars may be obtained from the Academic Registrar.

University of Liverpool

Candidates before admission to the examination for the D.M.R.E. must possess a registrable qualification approved by the University in medicine and surgery, and must have attended courses of instruction in (*a*) physics (two terms), (*b*) (i) radiology, and (ii) electrology during nine months in the X ray and electrotherapeutic department of a hospital or hospitals. An examination is held in March and June (Physics) and in June (Radiology and Electrology). Examination in either part may be taken separately. A registration deposit fee of £5 5*s.* is charged on application and credited to the fees, but is not returnable in the event of the candidate failing to register. These courses commence during the first week in October. Application should be made to the Dean, Faculty of Medicine, the University of Liverpool.

University of Edinburgh

Candidates for the Diploma in Radiology must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications from some other licensing body, or of other universities or medical schools specially recognised. The course of study for the Diploma covers an academic year (9 months) and commences in October. The number of candidates to be admitted to the course is limited, and early application for admission is essential. Candidates are not admitted to the examination for the Diploma until after the lapse of not less than one year from obtaining a recognised qualification. The examination, which is written, oral, and practical, is in two parts: (*a*) Physics, and (*b*) Radiology. Full particulars may be obtained from the Dean of the Faculty of Medicine.

English Conjoint Board

The examination for the D.M.R., R.C.P. and S. comprises Part I. Physics, as applied to Radiology, and Part II. Medical Radiology, with special reference to its clinical application, including Radio-diagnosis, X Ray Therapy, and Radium Therapy. Both examinations, which are written, oral, and practical, are held during January and July. The course of study extends over one academic year of full-time study, subsequent to the attainment of a recognised qualification. Before admission to the examination the following certificates must be produced. For admission to Part I. evidence of having attended a course of instruction in physics as applied to radiology at a recognised medical school or institution for not less than three months. For admission to Part II. evidence of having attended at a recognised hospital courses of instruction, theoretical and practical, in medical radiology, including radio-diagnosis, X ray therapy, and radium therapy, with clinical experience for three terms.

Candidates may enter for Parts I. and II. either together or separately, subject to the production of the required certificates; but no candidate is permitted to proceed to Part II. of the examination until he has passed in Part I. Candidates must give 21 days' notice, in writing, of their intention to present themselves for examination, to the Secretary at the Examination Hall, 8–11, Queen-square, London, W.C.1, forwarding at the same time the necessary certificates of study. The conditions regarding admission to examination may be modified at the discretion of the Committee of Management in the case of a candidate (*a*) who has carried out original investigations in any subject of the examination, or (*b*) whose studies have extended over a prolonged period of time without fulfilling the exact conditions. Exemption will not be granted from any part of the examination.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY

English Conjoint Board

The Board grants the D.L.O. after an examination held in two parts, in June and December. Part I. comprises anatomy, embryology, and physiology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus. Part II. comprises the medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus, and the recognition and use of special instruments and appliances. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of one year of special study of the diseases of the ear, nose, pharynx, and larynx, after obtaining a registrable qualification, or a degree in medicine and surgery of a University recognised by the Board.

DIPLOMA IN TUBERCULOUS DISEASES

University of Wales

Candidates may be admitted to examination for the Tuberculosis Diseases Diploma after the lapse of not less than two years, from the date of obtaining a qualification in Medicine, Surgery, and Midwifery, registrable in Great Britain, or in the Dominions, Colonies, and Dependencies of the British Empire. Every candidate must have held a resident post in a Tuberculosis Hospital, or at an Orthopædic Institution providing not fewer than one hundred tuberculosis beds, or shall satisfy the Faculty of Medicine that he has pursued a special study of tuberculosis equivalent to the above for a period of not less than twelve months.

The examination is in two parts. Part I. (*a*) written and (*b*) oral and practical, including the examination of patients, and the recognition of specimens; Part II. is a written and practical examination on the epidemiology, pathology, and bacteriology of tuberculosis. Every candidate will be required to satisfy the examiners in both parts in the same examination. The Course of Instruction commences in January and continues until May each year, when the examinations are held.

A limited number of appointments for part-time Assistant Tuberculosis Physicians are advertised annually in September by the Welsh National Memorial Association, enabling suitably qualified and selected candidates to study for the Diploma. Particulars on application to the Secretary, Welsh National Memorial Association, Memorial Offices, Westgate-street, Cardiff. Further particulars may be obtained from the Secretary The Welsh National School of Medicine, The Parade, Cardiff.

DIPLOMA IN BACTERIOLOGY

University of London

The course of study for the Academic Post-graduate Diploma in Bacteriology extends over one academic year and is open to (*a*) Graduates in Medicine, Science, and Pharmacy of this or another approved University, whose previous training has, in the opinion of the University, fitted them to profit by the Course; and (*b*) registered medical practitioners and other students who, though not graduates, have obtained a qualification and undergone a previous training which, in the opinion of the University, has fitted them to profit by the Course.

A Course necessary to fulfil the regulations of this Diploma has been planned by the London School of Hygiene and Tropical Medicine, Keppel-street, London, W.C., and full particulars with regard to the Diploma may be obtained from the Academic Registrar, University of London, South Kensington, S.W.7.

DIPLOMA IN CLINICAL PATHOLOGY

University of London

The course of study for the Academic Post-graduate Diploma in Clinical Pathology extends over one calendar year, and is open to graduates in Medicine and to registered medical practitioners. The subjects are (1) Morbid Anatomy and Histology; (2) Bacteriology and Serology; (3) Biochemistry. The examination is held in December. Particulars may be obtained from the Academic Registrar, University of London, South Kensington, S.W.7. Particulars of the External Diploma in Clinical Pathology may be obtained from the External Registrar at the same address.

DIPLOMA IN ANÆSTHETICS

English Conjoint Board

Examinations for the new diploma of D.A. will take place twice yearly, in May and November; the first examination will be held on Nov. 8th next. Tests will be written and oral. Subjects include history, theory, and practice of anæsthetics; pharmacology and elementary chemistry of anæsthetic drugs; pre- and post-operative conditions relevant to anæsthesia. A candidate must either have a resident appointment in a recognised gene hospital for twelve months, of which at le shall have been as resident anæsthetist, or have administered anæsthetics in a hospit less than one thousand occasions, at least one-half of which shall have been for major surgical procedures. These conditions may be modified for candidates who have carried out original investigations in the science or practice of anæsthetics or whose studies have extended over a long period without fulfilling the exact conditions. During the next three years the diploma may be granted to anæsthetists of not less than ten years' standing attached to a teaching hospital.

DIPLOMA IN CHILD HEALTH

English Conjoint Board

The first examination for the new diploma of D.C.H. will be held on Oct. 4th, next. The examination (written, oral, and clinical) will comprise the following subjects, special emphasis being laid on their preventive aspects: (*a*) anatomy, physiology, and pathology of childhood; (*b*) development of the child, physical and mental, including speech, with their disorders; physical education in childhood; (*c*) hygiene and dietetics of infancy and childhood; (*d*) affections of the new-born; (*e*) disease in infancy and childhood, medical and surgical; (*f*) therapeutics of infancy and childhood, including remedial treatment, physical and mental; (*g*) legislation and public administration in regard to the care of children, including the methods of infant welfare centres and of the school medical service. The candidate must have been in a recognised children's hospital or department as resident medical officer for six months or as clinical assistant for a year, though these conditions may be modified in the case of candidates who have carried out original research or whose studies and practice have extended over a long period. Forms of application, to be obtained from the secretary, Examination Hall, 8, Queen-square, London, W.C.1, must be returned at least 21 days before the examination.

DENTAL SURGERY

TEACHING INSTITUTIONS IN DENTISTRY

REGISTRATION on the Medical Register entitles a practitioner to practise dentistry, although he cannot register as such without degree or licence in dentistry; but few dental appointments at general or special hospitals or dispensaries are available save to those with a special diploma, and, until registered on the Dentists Register, no dental work under the Additional Benefit Scheme of the National Health Insurance Act can be undertaken.

The Examining Bodies in Dentistry which grant degrees and diplomas in the subject are as follows: Royal College of Surgeons of England, Royal College of Surgeons, Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow, Royal College of Surgeons in Ireland, and the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, St. Andrews, Dublin (Trinity College), Queen's University of Belfast, and the National University of Ireland. The student should apply to the secretaries of the various Conjoint Boards or to the Deans of the medical faculties or medical schools for a syllabus.

TEACHING INSTITUTIONS IN LONDON

Royal Dental Hospital

The Royal Dental Hospital of London, School of Dental Surgery, Leicester-square, is a school of the University of London. The school provides the special dental education required by the University of London for the B.D.S. Degree and the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 6 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The instructor at the commencement of each session gives a course of lectures on Operative Dental Surgery. The two senior house surgeoncies and the six house surgeoncies are held for four months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £25. One Scholarship in Dental Mechanics and Metallurgy, value £25. For full information as to scholarships and prizes, and other matters connected with the course, application should be made to the Dean.

University College Hospital Dental School

This Hospital and School, situated at the corner of Great Portland and Devonshire-streets, W., has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Anatomy and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the *National Dental Hospital*—the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. A prospectus containing full information as to lectures, fees, and prizes may be had on application to the Sub-Dean for Dental Students, who attends at University College Hospital Medical School, University-street, W.C.1, on Wednesday mornings from 9.30 to 10.30, and at other times by appointment.

Guy's Hospital Dental School

The work of the Dental Department begins daily at 9 A.M. both in the anæsthetic rooms and in the conservation room. The Extraction Rooms have now been entirely reconstructed. There is ample accommodation for extractions, both with general and local anæsthetics, together with waiting and recovery rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrators, the dental house surgeons, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M., and is under the charge of the Director aided by the assistant to the Director. It affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. There is a separate room for denture patients affording accommodation for 15 chairs and a separate department for children with accommodation for 20 chairs. The Members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by the Director of the Conservation Room together with his Assistant, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study by the Staff Demonstrators. Students in Dental Prosthetics are occupied with this subject for two years, during which time a graded, systematic, and full course of instruction is given under the supervision of the Director of the Prosthetic Laboratory, assisted by four demonstrators, a house surgeon, and skilled mechanics.

Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. Students who enter for a medical as well as a dental course are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves.

Fourteen house surgeons, 20 assistant house surgeons, and 4 student demonstrators of Dental Histology are appointed annually. The following appointments are held by students: Full surgeon's dresser, assistant surgeon's dresser, dresser in the children's department, casualty dresser, dresser to the director of the conservation room, probationary dresser, clerk to the anæsthetist and dresser in the general anæsthetic and local anæsthetic rooms. Two Entrance Scholarships are awarded annually in April as follows: (1) A War Memorial Scholarship in Arts of the value of £40 per annum for four years, open to students under 19 years of age. Candidates are required to take English and any two of the following subjects: French, German, Latin, Greek, and Mathematics. (2) A Science Scholarship of the value of £40 per annum for four years, open to students under 20 years of age. Candidates are required to take two of the following subjects: Chemistry, Physics, and Biology. Further information will be supplied by the Dean of the Medical School.

King's College Hospital Dental School

The Dental School is part of the Medical School of King's College Hospital, and was opened in November, 1923. The Dental Out-patient Department of the Hospital is used for the performance of dental extractions. A large Conservation Room with provision for 40 dental chairs has been equipped. Smaller rooms are used for clinical teaching and administrative requirements, and a specially equipped laboratory for training in dental mechanics. An X ray apparatus has been installed for use in dental skiagraphy. The Dental museum contains a large number of specimens illustrating oral, buccal, dental, and other diseases. The library, lecture theatre, lecture rooms, common rooms, and the refectory are all available for the use of students. Courses of study, including practical work, are provided for the degree of Bachelor of Dental Surgery of the University of London, and for the Diploma in Dental Surgery of the Royal College of Surgeons of England. Special arrangements can be made for those students who wish to take a medical degree or qualification in addition to a degree or diploma in Dental Surgery.

The following salaried appointments are open to qualified members of the School: Registrar, Resident House Surgeon, Non-Resident House Surgeon, and Tutors in Dental Mechanics, Operative Dental Surgery, and Dental Materia Medica.

Full particulars of the Dental School may be obtained on application to the Dean, or to the Secretary of the Medical School, King's College Hospital, Denmark Hill, London, S.E.5.

London Hospital Dental School

This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated, and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the student's cabinet. Electric sterilisers are supplied in each department and motor engines where required. The school possesses, in addition to the Theatres, Laboratories, and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, an X Ray Room, and Laboratories for Practical Metallurgy and Prosthesis. A systematic course of instruction is arranged for pupils. The up-to-date Laboratory contains every modern apparatus, and is in charge of a skilled curator and his assistants. Entrance Scholarship: Francis Farmer Entrance Scholarship in Science, value £25; no age limit. Subjects: Chemistry and Physics. Prizes: The Harold Fink Prize in Operative Dental Surgery, value £8 8s.; the "London" Prize in Dental Prosthesis, value £6 6s. Prizes are also offered for competition at the end of each of the courses of lectures in the curriculum. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, and an Athletic Ground. A new Residential Hostel has been opened, and provides accommodation for upwards of 50 students. For full particulars as to Scholarships and Prizes, fees and course of study advised, apply to the Dean of the Medical School.

TEACHING INSTITUTIONS OUTSIDE LONDON

Birmingham Dental Hospital

The Dental Hospital in Great Charles-street has accommodation for 100 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery, including Radiology and a department for Practical Pathology and Bacteriology. The hospital, both internally and externally, has been renovated, and several departments have been reconstructed. The operations performed annually average 70,000, including gold and other fillings, crowns, bridges, porcelain inlays, jacket crowns, and injections for block and infiltration anæsthesia. The orthodontic department is one of the foremost in the country. The prosthetic and mechanical department is large and well lighted and two highly skilled instructors are always present, while two honorary officers give daily demonstrations. Application for information as to fees and scholarships must be sent to the Dean of the Medical Faculty, Birmingham University, or the Dean of the Dental Hospital, Birmingham.

Leeds University School of Dentistry

The School of Dentistry is adequately equipped to provide for the complete training of the dental student. It forms a part of the Leeds School of Medicine whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital. The School is now in occupation of a spacious new building especially designed to the requirements of modern dental teaching. The School is also the dental department of the General Infirmary, and its close association with the work of that institution ensures an adequate supply of clinical material, and enables a fuller insight into the position dental surgery holds in relation to general medicine and surgery, especially with regard to the major diseases and injuries of the head and neck. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time teachers give the instruction in clinical dental surgery, prosthetic dentistry, and mechanics, which is carried out under the supervision and direction of the Professor of Clinical Dental Surgery and members of the Honorary Staff. Special facilities are provided for instruction in Orthodontia, Radiography, Local and General Anæsthetics, and Bacteriology. Prizes are offered for competition to students in their respective years of study. Post-graduate clinical courses are arranged in collaboration with the Dental

Board of the United Kingdom, and facilities exist to meet the requirements of dental surgeons desirous of obtaining special post-graduate instruction. Communications should be addressed to the Warden, School of Dentistry, Leeds, from whom a prospectus may be obtained.

University of Manchester School of Dental Surgery

Courses of study are provided to meet the requirements for the B.D.S. Degree and the L.D.S. Diploma of the University of Manchester, and for the L.D.S. Diploma of the Royal College of Surgeons of England. At the Dental Hospital instruction is given in practical Dental Mechanics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Prosthetics, Anæsthetics, and Radiography by specially appointed Clinical Teachers. All the courses of instruction are open to women students. Copies of the prospectus may be obtained on application to the Dean.

Newcastle-upon-Tyne Dental Hospital and Sutherland Dental School

This institution is a component part of, and constitutes the Dental Department in, the University of Durham College of Medicine. A dental hospital, erected within the grounds of the Royal Victoria Infirmary and equipped with the most modern apparatus, was opened in 1932, and it is possible to undertake the whole of the dental curriculum—i.e., systematic lectures, dental and general hospital practice, together with the mechanical pupilage—at the College. The Dental Board of the United Kingdom recognises the school for the purpose of granting its bursaries to students who are able to comply with the conditions laid down by the Board. The composition fees payable by dental students are £90 for all systematic lectures and laboratory work at the College for the B.D.S. (or £85 for the L.D.S.), £50 for dental hospital practice for B.D.S. (or £40 for L.D.S.), £16 16s. for general hospital practice, and £80 for pupilage in mechanics. A dental prospectus and any other information may be obtained from the Dean, University of Durham College of Medicine, Newcastle-upon-Tyne.

SCOTTISH TEACHING INSTITUTIONS

Edinburgh Dental Hospital and School

The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Registrar.

Incorporated Glasgow Dental Hospital

This hospital is located at 211, Renfrew-street, Glasgow. The school is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, Radiology, Anæsthetics, and Dental Materia Medica. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extramural schools where special provision is made for Dental Students. The new Dental Hospital is now open and is equipped with all the modern methods for teaching students. Post-graduate courses will be inaugurated during the coming winter.

Glasgow Royal Infirmary

Dental Department: The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry, three months; Surgery, six months; Medicine, six months; Materia Medica, three months. Clinical Medicine (three months) and Clinical Surgery (six months) are taken at the Royal Infirmary.

IRISH TEACHING INSTITUTION

Dental Hospital of Ireland

All Dental Students who have passed their Second Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anæsthetics. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Post-graduate courses are given in Orthodontics. Further particulars can be obtained from the Dean, at Lincoln-place, Dublin.

Diploma in Psychological Medicine: University of London

Addendum to p. 531

The course of training arranged by the INSTITUTE OF MEDICAL PSYCHOLOGY, Malet-place, London, W.C. (formerly the Tavistock Square Clinic for Functional Nervous Disorders) is not intended to cover the whole field of mental illness. For the purposes of the University of London Post-graduate Diploma in Psychological Medicine, it provides facilities for the practice in Psychoneuroses and Early Psychoses and in Mental Retardation and Delinquency required under Regulation 3, Section II. (*d*) and (*c*) for this Diploma.

There are post-graduate courses in psychotherapeutic theory and method. The main course, covering one year's work, is arranged for two groups; (*a*) those who can only manage to devote three hours twice a week; (*b*) those who, with a view to specialisation, are prepared to give as a minimum twelve hours a week (attending on three days). The course is limited to a membership of twelve practitioners. In addition there is a five weeks' introductory course of lectures with case discussions and ten tutorials on Child Guidance (or Mental Health in Childhood). Systematic Lectures are given twice a week throughout the year.

These courses form part of the one year's course in psychotherapeutic theory and method, but may be attended by qualified medical practitioners who wish to take them as isolated courses of lectures. Week-end courses will be given at intervals during the year. A short course on the Psychoneuroses, intended for those with some knowledge of elementary principles will be given for one fortnight in the Summer.

Notes, Comments, and Abstracts

A HUNGARIAN STUDENTS' NUMBER

A SPECIAL number of the *Orvosképzés* contains articles on various aspects of medical education by all the prominent teachers of the Budapest school; some of them are swan-songs, for they are written by distinguished men now retiring under the age limit. The variety of languages is noteworthy; of the signed articles 21 are in Magyar, 20 in German, 5 in French, 3 in English, and 1 in Italian. Two prefatory articles are by outsiders. Prof. A. Eiselsberg (Vienna) writes on medical education and Prof. Ludwig Aschoff (Freiburg i. Br.) on the new outlook of medical teaching in Germany. Eiselsberg laments that Latin should be dropping out of medicine. In the 'fifties Billroth lectured to his Greifswald students in Latin, and at Göttingen Latin was spoken in the clinic, partly out of consideration for patients' feelings. Although national pride might make this no longer feasible, enough Latin must be retained for the student to find his way about medical terminology. Eiselsberg spoke (of course) of overcrowding in the medical curriculum which was still a problem in Vienna, although such ballast as materia medica had long been dropped and the "free-will" year which before the war more than half the Viennese medical students were obliged to put in was now available for other purposes. Prolongation of the curriculum was out of the question; he saw nothing for it but to shorten the vacations. He spoke with pride of the course of general pathology; Vienna stood alone in having a special institute for the purpose in which morbid anatomist, clinician, and pharmacologist were associated. Finally he expressed anxiety at the excessive number of students still qualifying in medicine. Last year 203 Austrians took their M.D., only 42 less for little Austria than the 245 who qualified in 1914–15 to serve the great Austrian confederacy of States. It was, he feared, not so much the attraction of medicine as the lack of other openings which was responsible for this, and he spoke with horror of the three sons of a porter at a railway station in the neighbourhood of his own home who were all studying at the university. Aschoff set out his conception of general pathology on which the whole of the medical course should turn, and he claimed that such a course was at present only given in German-speaking and related countries. More and more, he said, was he convinced that the medical man of the future must be trained in biology.

M.D. DEGREES OF SWISS UNIVERSITIES.—The Universities of Basle, Bern, Geneva, Lausanne, and Zürich grant the degree of Doctor of Medicine to "medical practitioners from other countries who are legally entitled to practise in their country of origin" under the following *conditions*: 1. Pursue a course of study in the final subjects of the medical curriculum, and pass a viva-voce examination in such, at the end of one academic year (nine months). 2. Prepare at the same time a thesis for the doctorate, which has to be accepted by the Faculty of Medicine towards the end of the year. The total fees (examination and diploma) amount to Fr.450 Swiss (£25). At Lausanne there is a tutor for British practitioners. At Geneva and Lausanne a laboratory or clinical course is so arranged that it provides the subject matter for the thesis, which is prepared during the entire stay. The candidate should make written application to the Dean of the Faculty of Medicine, and further information can be obtained in this country from the hon. secretary of the Lausanne Medical Graduates' Association (Dr. Charles Franklyn, The Corner House, Queensway, Lincoln).

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. R. E. Rampling to *Arethusa*, and as Squadron Medical Officer (on transfer of flag).

Surg. Lt.-Comdr. M. Barton promoted to rank of Surg. Comdr. and Surg. Lt. A. M. Lawrence-Smith to rank of Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Sub-Lts. K. E. O. Ringdahl promoted to Surg. Lt., and L. S. Anderson (proby.) to *Iron Duke*.

H. J. Wade entered as Proby. Surg. Lt.

Proby. Surg. Sub-Lt. S. E. Cooke to *Rodney*.

ARMY MEDICAL SERVICES

Col. G. S. Wallace, O.B.E., late R.A.M.C., having attained the age for retirement, is placed on ret. pay.

Lt.-Col. and Bt. Col. F. Casement, D.S.O., from R.A.M.C., to be Col.

Col. G. S. Wallace, O.B.E., late R.A.M.C., relinquishes the appt. of Professor of Hygiene, Royal Army Medical College.

Col. W. B. Purdon, D.S.O., O.B.E., M.C., late R.A.M.C., to be Professor of Hygiene.

ROYAL ARMY MEDICAL CORPS

Maj. H. C. D. Rankin, O.B.E., to be Lt.-Col.

Short Serv. Commissions.—Lt. (on prob.) A. H. T. F. Fullerton is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.

H. C. George to be Lt. (on prob.).

ROYAL AIR FORCE

Flying Offrs. R. G. James to R.A.F. Station, Mount Batten, and A. R. C. Young to No. 3 Flying Training School, Grantham.

INDIAN MEDICAL SERVICE

Lts. (on prob.) to be Capts. (on prob.): M. G. Leane, G. E. S. Stewart, and D. P. Dewe.

The appointments of the undermentioned officers are confirmed:—

Lts. (now Capts.): W. J. Virgin, J. Brebner, H. W. G. Staunton, J. D. Gray, D. W. Taylor, P. H. Addison, J. W. D. Goodall, F. J. Doherty, and S. G. O'Neill.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 17TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1365; diphtheria, 870; enteric fever, 64; acute pneumonia (primary or influenzal), 484; puerperal fever, 40; puerperal pyrexia, 106; cerebro-spinal fever, 7; acute poliomyelitis, 34; acute polio-encephalitis, 3; encephalitis lethargica, 15; dysentery, 17; ophthalmia neonatorum, 82. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 23rd was 2552, which included: Scarlet fever, 741; diphtheria, 913; measles, 32; whooping-cough, 432; puerperal fever, 15 mothers (plus 0 babies); encephalitis lethargica, 270; poliomyelitis, 13. At St. Margaret's Hospital there were 21 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 13 (0) from measles, 7 (2) from scarlet fever, 16 (3) from whooping-cough, 22 (1) from diphtheria, 64 (10) from diarrhœa and enteritis under two years, and 14 (3) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa and enteritis were scattered over 30 great towns, the highest numbers being Liverpool and Birmingham each 9, Hull 4, Birkenhead 3, no other great town more than 2. Liverpool also reported 7 deaths from measles, Birmingham 2. Fatal cases of diphtheria were reported from Liverpool 5, Warrington and Birmingham each 3.

The number of stillbirths notified during the week was 284 (corresponding to a rate of 39 per 1000 total births), including 39 in London.

Appointments

Certifying Surgeons under the Factory and Workshop Acts: Dr. N. R. CUNNINGHAM (Bradford, West, County of York (West Riding)); Dr. A. A. HEATHCOTE (Newport, Isle of Wight); Dr. C. G. Walker (Oxted, Surrey).

Vacancies

For further information refer to the advertisement columns

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

All Saints' Hospital for Genito-Urinary Diseases, Austral-street, S.E.—Res. H.S. At rate of £100–£150.

Bedford County Hospital.—First H.S. At rate of £155.

Belfast, Forster Green Hospital for Consumption and Chest Diseases.—H.P. At rate of £150.

Belfast, Royal Maternity Hospital.—Two Res. H.S.'s. At rate of £100 and £52 respectively.

Blackburn County Borough.—Asst. M.O.H. £600.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £150.

Bristol Eye Hospital.—Jun. Res. H.S. £100.

Bristol, Frenchay Park Children's Orthopædic Hospital and Sanatorium.—Res. M.O. £250.

Cancer Hospital, Fulham-road, S.W.—Asst. Radiologist. £350. Also H.S. At rate of £100.

Central London Throat, Nose, c [illegible] *road, W.C.*—Hon. Assts. to [illegible]

Ceylon, Colombo Municipal [illegible] Rs.12,000/- a year.

Chester Royal Infirmary.—H.S. for Special Depts. £150.

Chichester, West Sussex County Mental Hospital.—Third Asst. M.O. £350.

Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose and Throat Depts. £175.

Doncaster Royal Infirmary and Dispensary.—Sen. Res. £250. Also Res. Anæsthetist. At rate of £175.

Downpatrick, Down Mental Hospital.—Asst. M.O. £300.

Dreadnought Hospital, Greenwich, S.E.—Receiving Room Officer and H.P. At rate of £200 and £110 respectively. Also H.S. At rate of £110.

Dudley, Guest Hospital.—H.S. and Second H.S. £200 and £170 respectively.

East Ham Memorial Hospital.—Pathologist. £300.

Enfield U.D.C.—Asst. M.O.H. and Asst. School M.O. £600.

Exeter, Royal Devon and Exeter Hospital.—H.P. Also H.S. to Ear, Nose, and Throat Dept. Each at rate of £150.

Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. At rate of £200.

Great Yarmouth General Hospital.—H.S. £140.

Hammersmith Hospital, Ducane-road, W.—Asst. Radiologist. £700.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. M.O. for Out-patient Dept. At rate of £100.

Hastings, Royal East Sussex Hospital.—Hon. Anæsthetist. Also Locum H.S. £5 5*s.* per week.

[illegible] *Hospital.*—H.P., and H.S. and Cas. O.

[illegible] *en, Great Ormond-street, W.C.*—Research [illegible]

[illegible] At rate of £150.

[illegible] *Kirkburton.*—Fifth Asst. M.O. [illegible]

Leicester Royal Infirmary.—H.S.'s, Cas. O., H.P.'s, Jun. Res. Anæsthetist. Each at rate of £125. Also Jun. Cas. O. At rate of £100.

Liverpool, County Mental Hospital, Rainhill.—First and Second Asst. M.O.'s. £700 and £650 respectively.

Liverpool Royal Children's Hospital.—Res. M.O. for Heswall Branch. At rate of £120.

Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt. £200.

London Lock Hospital, 283, Harrow-road, W.—Res. M.O. to Female Depts. At rate of £175.

Lowestoft Borough.—Consultant Obstetrician. £3 3*s.* per [illegible]

[illegible] *nfirmary.*—Second H.S. £150.

[illegible] *hildren's Hospital, Garlside-street.*—Two [illegible] h at rate of £150.

[illegible] *y's Hospitals.*—Res. Obstet. O. £175. Each at rate of £50.

[illegible] *2, Fitzjohn's-avenue, N.W.*—Pathologist.

[illegible] *Riding Infirmary.*—Third H.S. £125.

[illegible] *ton, S.W.*—Two Res. H.S.'s. Each at rate of [illegible]

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. or H.S. At rate of £100.

Northampton General Hospital.—H.S. H.S. to Ear, Nose and Throat Dept. Also Cas. O. Each at rate of £150.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £150.

Plymouth, Prince of Wales's Hospital, Lockyer-street.—H.S. At rate of £150.

Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.

Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—H.S. and H.P. Each at rate of £110.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P. At rate of £125.

Princess Louise, Kensington, Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £100.

Queen Alexandra's Imperial [illegible] *The War Office, Whitehall, S.W.*- [illegible]

Queen Charlotte's Maternity [illegible] *N.W.*—Res. Anæsthetist. A rate of £100. Res. Anæsthetist and Dist. Res. M.O. At rate of £90. Asst. Res. M.O. At rate of £80. Also Obstet. Surgeon to Out-patients, and Fourth M.O. to Antenatal Dept.

Rotherham Hospital.—Cas. H.S. £150.

Royal College of Physicians, Pall Mall East, S.W.—Milroy Lecturer.

Royal National Orthopædic Hospital, Gt. Portland-street, W.—Two H.S.'s (one for Country Branch). Each at rate of £150.

St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

St. Thomas's Hospital, S.E.—Surgeon. Also Surgeon to Out-patients.

Salford Royal Hospital.—H.P., two H.S.'s. Also Cas. H.S. Each at rate of £125.

Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Asst. Cas. O. At rate of £120 and £80 respectively.

Sheffield Royal Infirmary.—Second Asst. Cas. O. At rate of £80.

Southampton, County Borough.—Deputy M.O.H. £720. Also Asst. Port M.O.H. £500.

[illegible] *Hants and Southampton Hospital.*— [illegible]

[illegible] *Women, Clapham Common, S.W.*— [illegible]

[illegible] st. M.O. £600.

[illegible] I.S. At rate of £140.

[illegible] Villiam Julius Mickle Fellowship. [illegible]

Wakefield, Menston Mental Hospital.—Fifth Asst. M.O. £350.

West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.

[illegible] *Sanctuary, S.W.*—"Wander" [illegible]

[illegible] *lesden-road, N.W.*—Asst. Surg. O. [illegible]

Wolverhampton Royal Hospital.—H.S. for Fracture and Orthopædic Dept. At rate of £100.

Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.—Res. M.O. £175.

Zetland County Council.—M.O. and Public Vaccinator. £80.

Births, Marriages, and Deaths

BIRTHS

COOK.—On August 23rd, at Beaconsfield, the wife of J. A. Lumsden Cook, M.B. Edin., of a son.

CORFE.—On August 23rd, at Welbeck-street, the wife of Felix N. Corfe, M.R.C.S. Eng., L.D.S., of Muswell Hill, of a son.

EVANS.—On August 20th, at Eltham, the wife of J. D. Evans, L.M.S.S.A., of a son.

FORSTER.—On August 19th, in Jerusalem, the wife of E. D. Forster, M.R.C.S. Eng., Hebron, of a son.

MCCONAGHEY.—On August 18th, at a nursing-home, Plymouth, the wife of Richard M. S. McConaghey, M.B. Edin., of a daughter.

PURVIS.—On August 23rd, at Southampton, the wife of Raymond Purvis, M.B. Lond., F.R.C.S. Eng., of a daughter.

WEBB.—On August 26th, 1935, to Josefine, M.B., B.S. Lond., wife of John Robert Douglas Webb, Lieut.-Colonel Indian Medical Service, of Haddon Close, (near) Didcot, Berkshire—a son.

MARRIAGES

O'MEARA—CROFT.—On August 20th, at Warwick, Francis Joseph O'Meara, M.D. Dub., F.R.C.P. Irel., Major, R.A.M.C., to Janet Glendower Croft.

DEATHS

ACTON.—On August 23rd, Lt.-Colonel H. W. Acton, C.I.E., M.R.C.S. Eng., I.M.S., late Director of the School of Tropical Medicine, Calcutta.

BISHOP.—On August 19th, in Guernsey, Henry Draper Bishop, M.D. Brux., M.R.C.S. Eng., for 27 years medical officer of health to the island.

FULLER.—On August 17th, at Tremeer, Perranporth, Andrew Fuller, M.R.C.S. Eng., L.R.C.P. Edin., in his 77th year.

GOWAN.—On August 22nd, at Bournemouth, Bowie Campbell Gowan, M.R.C.S. Eng., L.S.A., aged 83.

HUTCHINSON-LOW.—On August 21st, at a nursing-home, Richard Marsden Hutchinson-Low, O.B.E., M.B. Edin., late of Cromwell-road, Kensington.

WEBSTER.—On August 21st, at Ventnor, I. of W., Henry William Webster, M.D. Brux., M.R.C.S. Eng., aged 91.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

WE deeply regret to record the death of Dr. George H. Morrison, which occurred on August 23rd as a result of injuries received through being knocked down by a motor omnibus. Dr. Morrison, who for the last eight years has been a medical adviser to Bayer Products Ltd., was previous to that a sub-editor on the staff of THE LANCET, and his tragic death will be learned with regret by many of our readers as well as of the staff of the paper.

ADDRESSES AND ORIGINAL ARTICLES

CHRONIC CONSTRICTIVE PERICARDITIS

(PICK'S DISEASE)

TREATED BY PERICARDIAL RESECTION*

By Paul D. White, M.D. Harvard

FROM THE MASSACHUSETTS GENERAL HOSPITAL, BOSTON, MASS.

I BRING to you progress notes of a study of a subject concerning which pioneer but forgotten observations were made by Englishmen years ago, especially by Lower[25] in 1669, by Chevers[9] in 1842, and by Wilks[43] in 1870, but which has received no adequate attention in English medical writings of our own day. This subject concerns congestion that is not due to myocardial failure and in particular that which results from chronic constrictive pericarditis. The teachings of Mackenzie, Lewis, and others of the English school dealing with congestive heart failure have borne rich fruit, but the small though important harvest of the exceptional cases of congestion of other sort has not yet been gathered.

Introduction

Chronic constrictive pericarditis consists of a chronic fibrous or callous thickening of the wall of the pericardial sac which is so contracted that the normal diastolic filling of the heart is prevented. A condition called "inflow stasis" results. There may or may not be calcification of the pericardium, obliteration of the pericardial cavity, or important external pericardial adhesions. There may or may not be an associated accumulation of pericardial fluid in small amount, as in pockets. The parietal pericardium may be preponderantly affected or the epicardium also seriously involved; or both pericardial membranes may be securely or even inseparably united. One section of the pericardium, as over the cardiac apex, may remain relatively free and but slightly thickened, while another part, as over the right auricle and great veins, is markedly contracted; or the entire heart and roots of the great vessels may be encased uniformly in a tightly fitting envelope. There may or may not be an acute or chronic polyserositis, which is, contrary to a common belief, a different thing. There may or may not be frosted liver or spleen. There may or may not be heart disease itself—in my experience the association of chronic constrictive pericarditis, of any important degree at least, with heart disease is very rare; I have encountered only one likely case, and this I believe to be a coincidence.

The signs of chronic constrictive pericarditis are similar in most respects to those of acute constrictive pericarditis, or cardiac tamponade, due to pericardial effusion, and indeed the signs of the former condition may follow the signs of the latter without any interruption at all, or more often after an interval of months or years. The insidious evolution of the disability due to chronic constrictive pericarditis, frequently with no history of a preceding acute pericarditis, makes the diagnosis far more difficult than that of acute constrictive pericarditis that usually develops with striking signs and symptoms in the course of a few hours or days.

In 1896 Pick[30] emphasised the common findings of liver involvement and preponderant ascites, and so the disease has often been called by his name.

The establishment of the diagnosis of chronic constrictive pericarditis has a three-fold importance: (1) it affords the explanation of a group of symptoms and signs in an obscure case; (2) it obviates confusion with other conditions, especially mitral stenosis, cirrhosis of the liver, polyserositis, and nutritional or other rare type of œdema; and (3) expert thoracic surgery may now lead to cure of what was once a hopeless disease.

Historical Résumé

Galen,[18] about A.D. 160, described pericardial effusion in a monkey and scirrhous thickening of the pericardium in a cock and surmised that the same conditions might occur in man and interfere with proper heart function; also he observed post-traumatic septic anterior mediastinitis in a young man on whom he operated successfully, removing some of the diseased sternum, and even the vertex of the pericardium, which he uncovered (the first record of pericardial resection). Although, moreover, the hairy heart had been mentioned now and again in the Middle Ages (and considered a sign of valour), Lower[25] should receive the credit for the first satisfactory account of pericardial disease in man. He may be said also to have initiated the era of recognition of acute and chronic constrictive pericarditis which progressed for about one hundred years. This was in 1669, some years before Bonetus[3] and Vieussens[39] reported cases in 1679 and 1715 respectively. Lower's account is so illuminating that I shall give several quotations from it:—

> "Although the fluid enclosed in the pericardium serves effectively for lubricating the surface of the heart and facilitating its movement, it sometimes happens that a profuse effusion oppresses and inundates the heart. This envelope becomes filled in hydrops of the heart; *the walls of the heart are compressed by the fluid settling everywhere so that they cannot dilate sufficiently to receive blood* (italics mine); *then the pulse becomes exceedingly small, until finally it becomes utterly suppressed by the great inundation of fluid,* whence succeed syncope and death itself. . . . Just as the accumulation of too much water in itself brings harm to the heart so it happens that trouble comes when heart and pericardium become everywhere closely adherent; whence, when it becomes attached also to the diaphragm the motion of the heart necessarily mingles and combines with that of the diaphragm. That there must needs be much impediment and inconvenience to both has been shown above and will be still more apparent from the story that follows."

Lower then cites the history of a London housewife, aged 30, who over a period of three years until her death declined steadily in health, with dyspnœa, precordial discomfort, weakness, and a small and intermittent pulse. At post-mortem examination the only important finding was, complete pericardial adhesion. Lower states that "this membrane was not, as is proper, thin and transparent, but thick, opaque, *and even callous.*"

In 1728 Lancisi[27] made the clinical picture of chronic constrictive pericarditis much clearer by citing the case of a man, aged 24 years, with small pulse and marked swelling of the jugular veins and of the abdomen, who showed at necropsy a small heart with thick completely adherent pericardium.

To complete the first century of the recognition of chronic adhesive pericarditis, Morgagni[29] in 1761 reported seven cases; one of whom, a man 40 years old with a very small pulse, showed a heart "so constricted and confined that it could not receive a proper quantity of blood to pass on." But, he noted that most of the cases were incommoded little or not at all even shortly before death, as was true of a strenuous fisherman. It was this rather abrupt realisation that there may often be an adherent pericardium without any *symptoms* or *signs* therefrom, a point of view emphasised further by Laennec [26] in 1819, that distracted the attention of the medical profession in general from the possible importance of chronic constrictive pericarditis for well over one hundred years; this may be termed the period of neglect. There is little mention of the subject except in passing, if at all, by the leading medical authors of the day, including Corvisart,[12] Kreysig,[24] Laennec,[26] Hope,[22] Williams,[44] Stokes,[36] and Skoda.[35]

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* The St. Cyres Lecture of the National Hospital for Diseases of the Heart, London, July 10th, 1935. The lecture has been divided into two parts, of which the second (to appear in our next issue) contains all the references.

Then at the very end of the nineteenth century (Pick,[30] 1896) there began a period of enlightenment which has culminated in (1) the clinical recognition of the disease itself, and (2) the successful application of surgery in a considerable proportion of the cases. During the half century, before Pick's work, four physicians made observations of great importance which for some reason or other almost completely escaped notice. Two of these four were Germans, Griesinger [20] and Kussmaul,[25] and they have been accorded more recognition than their two English predecessors, Chevers [9] and Wilks,[43] who were fully aware of the details of the clinical picture. It is of interest that Wilks in 1870 deplored the lack of interest in the subject to which his reading of Chevers (1842) had attracted his attention; while Kussmaul (1873) demanded recognition of the disease which Griesinger (1854) had observed; yet both Wilks and Kussmaul also apparently spoke to deaf ears.

Under the title "Observations on the Diseases of the Orifice and Valves of the Aorta," Chevers [9] cited as one cause of a narrow condition of the aorta the diminution of the heart that may follow the obliteration of the pericardial cavity. Hope had observed "that he had never examined after death a case of complete adhesion of the pericardium without finding enlargement of the heart, generally hypertrophy with dilatation." Chevers in contradiction wrote:

> "With deference to this high authority, I must venture to suggest that the above remarks can be applied only to one class of cases of this description—to those in which, superadded to the adhesion of the pericardium, there is also disease of the valvular passages of the heart; these cases are certainly the most frequent; but I think that a sufficient number of contrary instances have occurred, under my own notice, to prove that, where the valves are healthy, complete and close adhesion of the pericardial surfaces, far from producing hypertrophy and dilatation, has a tendency to be followed by general diminution in the size of the heart and its vessels, and contraction of its cavities."

He noted that in the course of seven years, 1835 to 1842, at Guy's Hospital no case of cardiac enlargement plus chronic obliteration of the pericardial sac failed to show valvular disease or other cause for the enlargement.

His first case report of chronic constrictive pericarditis was that of a girl, 18 years old, admitted to the hospital on June 23rd, 1841, suffering from ascites. About a year and a half previously she had begun to experience difficulty in breathing, and swelling of the legs, and afterwards of the abdomen, which was tapped three times. She died on Sept. 1st and autopsy showed tuberculosis of the right lobe of the cerebellum, miliary tubercles in the lungs, adherent pleuræ, adhesive pericardium, normal heart valves, "nutmeg" liver, congested kidneys, several pints of ascitic fluid, and roughened peritoneum over the liver and spleen, marked by small white depositions. "The cavity of the pericardium was entirely obliterated by a layer of firm and almost cartilaginous deposit, evidently of long standing, and, in some parts, nearly half an inch in thickness. The heart was remarkably small."

Chevers concluded that "the principal cause of dangerous symptoms in cases of the above description appears to arise from the occurrence of gradual contraction in the layer of adhesive matter which has been deposited around the heart, compressing its muscular tissue, and *embarrassing its systolic and diastolic movements, but more particularly the latter.*" (Italics mine.)

In 1870 Wilks [43] wrote: "I do not find, however, in turning to the standard text-books on medicine that mention is made of adherent pericardium, as one of the causes which lead to impairment of the heart's action with the usual accompaniments of venous congestion and dropsy. I may more than others feel surprised at this, since I have known what they may not have been aware of, that the subject had been discussed in the pages of this work thirty years ago." He said that "as a rule the greatest thickening is in front, so as to affect the right auricle and ventricle." The great veins and mediastinum may also be encased. He presented reports of six cases, five males aged 21, 9, 12, 26, and 24 years respectively, and one female aged 16 years.

In 1873 Kussmaul [25] also published an important paper which completed the era of the earliest clinical recognition of this disease. Evidently unaware of the work of Chevers and Wilks, he stated that callous mediastino-pericarditis demanded more attention than was given to it in contrast to the well recognised purulent mediastinal infections and that it had characteristic anatomical and clinical features, especially the involvement of the great vessels, the inspiratory swelling of the neck veins, and the pulsus paradoxus (which he named, but which is better called "marked decrease in pulse amplitude in inspiration—the Griesinger-Kussmaul pulse"—since in slight degree it is a normal phenomenon in the thoracic type of respiration). To his knowledge at that time only one clear-cut case of this condition had been reported, observed by Griesinger [20] in 1854, and described by Widenmann [42] in 1856 under the title "Consideration of the diagnosis of mediastinitis" in a Tübingen inaugural dissertation. The pulse tracing was published by Vierordt [41] in 1855.

With Griesinger's observation in mind Kussmaul in the summer of 1873 made ante mortem the correct diagnosis in two cases of "schwielige (callous) mediastino-pericarditis."

In spite of these four important contributions by Chevers, Griesinger, Wilks, and Kussmaul, and incidental papers by Concato [11] on polyserositis in 1881, by Hutinel [23] on "cardiac and tuberculous cirrhosis of the liver" in childhood in 1894, and by Harris [21] on indurative mediastino-pericarditis in 1895, little interest was shown in chronic constrictive pericarditis until Pick's [30] more familiar contribution at the end of the century. His paper was entitled "Concerning chronic pericarditis running its course under the guise of cirrhosis of the liver (pericarditic pseudocirrhosis of the liver) with observations on the frosted liver (Curschmann)." He reported three cases, all males, of 47, 26, and 24 years of age respectively, and discussed in particular the differential diagnosis between chronic pericarditis and primary cirrhosis of the liver.

Pick recognised the fact that the frosting of the liver was not a necessary part of the condition but rather a complication due to chronic peritonitis. Curschmann [13] in 1884 had labelled this condition "perihepatitis chronica hyperplastica (Zuckergussleber or frosted liver)," and described the case of a woman, 54 years old, who died with acute tuberculous peritonitis superimposed on chronic, which was a part of a polyserositis (pleuritis and pericarditis). Here the liver was small and hard and constricted by a dense chronically inflamed capsule 4 to 5 millimetres thick which surrounded the gall-bladder also. There was no trace of interstitial liver fibrosis or of vascular disease. The heart was apparently normal and not constricted by the adherent pericardium. Thus, this was not a case of Pick's disease. It is of further interest that "frosting" may occur elsewhere than over the liver and spleen, as in a case of frosted intestine without pericarditis reported by Borrmann [4] in 1927.

There are two other important names in the history of the work on chronic constrictive pericarditis before the turn of the century that demand mention, and they are Weill,[41] who in 1895 suggested, and especially Delorme,[14] who from 1895 to 1898 insisted, that relief might be brought to these patients some day by pericardial resection. It was a good many years, however, before this advice was followed.

Türk [37] in 1901 discussed the differential diagnosis of "pericardial concretion" and emphasised three points: first, that along with internal adhesions there may or may not be any important external adhesions with signs thereof, such as systolic retraction of the chest wall; second, that polyserositis or perivisceritis may antedate adhesive pericarditis; and third, that the differentiation from tuberculous peritonitis and from tricuspid and mitral valve disease is more difficult than from true cirrhosis of the liver, in contradistinction to Pick's point of view. He noted that the peritoneum may or may not be involved in these cases. Other workers on pericarditis over this period, like Broadbent and Brauer, were interested primarily not in chronic constrictive pericarditis but rather in external adhesions.

Another interval of time passed and then appeared the two most important recent contributions, namely, the introduction of pericardial resection itself independently by Rehn [31] and by Sauerbruch [32] in 1913, followed by Schmieden [33] in 1918, and the classical paper on the diagnosis of chronic constrictive pericarditis by Volhard [40] in 1923.

Volhard [40] stated that callous thickening and shrinkage of the pericardial sac result in a typical disease picture with effusion in the abdominal and sometimes in the thoracic cavities. That these effusions at times possess an inflammatory character because of attacks of polyserositis can make more difficult the explanation of the disease picture but cannot obscure the predominant influence of the callous pericarditis itself. He said further that the condition was hardly ever recognised, largely, he thought, because reliance was placed on several individual signs which were not pathognomonic. Much more important in his experience was the total picture of the disease with its evolution and "inflow stasis." He wrote that the most important and conclusive indication was the high-grade venous stasis with small heart, overfilling of the neck veins, big liver, and "ascites præcox." He pointed out that in this condition the cardiac difficulty is in the restriction of diastole in contrast to the effect of important external pericardial adhesions which increase the heart load in systole.

In the last ten years there have been a few additional papers worthy of note. In 1926 Fischer [15] amplified Volhard's classical paper on the diagnosis of chronic constrictive pericarditis. He introduced a discussion of the X ray evidence and observed that the heart shadow may be enlarged by the thick pericardium itself, that there may or may not be pericardial calcification, that pericardial calcification may occur without constriction of the heart, and that tuberculosis did not appear to be the ætiological factor in his own series of 8 cases (6 operated on and 2 others autopsied). Fischer also joined Schmieden the same year (1926) in a good review [33] of the subject with anatomical and physiological observations and a discussion of the pathological findings, the diagnosis, and the treatment; they reported 8 operations on 7 cases, one case having had successfully first, a freeing of the anterior surface of the heart over the right chambers, and second, a freeing of the posterior surface over the *left* chambers.

In 1934 Schur [34] of Vienna wrote an extensive review of the subject with a good bibliography.

He pointed out that cardiac systole as well as diastole is interfered with in Pick's disease but to a lesser degree, that the myocardium may also show some damage in these cases, that there may be a "hydrothorax præcox" as well as an "ascites præcox," that inspiratory swelling of the neck veins is a common and important sign (present in 13 of his 17 cases), that internal pericardial adhesions (concretio cordis) and external pericardial adhesions (accretio cordis) are not commonly isolated, both being present in varying degrees in most cases, that the heart may be enlarged (it was enlarged in 12 of his 17 cases), that auricular fibrillation is not uncommon (in 6 of his 17 cases), that there may be various electrocardiographic anomalies (12 of his 17 cases were studied by electrocardiogram—5 showed pronounced and 2 others showed a slight degree of low voltage), and that several of his cases had a rheumatic ætiology, which is not our experience.

Following the German lead, workers in three centres in the United States have taken a special interest in chronic constrictive pericarditis and have assembled important series of cases with operative cures:—

(1) Beck [1] and his associates in Cleveland, Ohio (14 certain cases of chronic constrictive pericarditis, 10 operated upon, 5 cured, 1 improved); (2) Burwell [7] and his associates in Nashville, Tennessee (10 certain cases of chronic constrictive pericarditis, 7 operated upon, 3 greatly relieved and 2 partially relieved); and (3) Churchill and myself [10] at the Massachusetts General Hospital, Boston (15 proved cases of chronic constrictive pericarditis, 12 operated upon, 6 cured, and 1 seventy-five per cent. relieved).

In other countries than Germany and the United States there has been relatively little interest in the diagnosis and operative treatment of this condition of chronic constrictive pericarditis. The lack of an adequate discussion of the diagnosis in the English language has caused me to present herewith this historical review and a survey of our own cases in Boston with their considerable percentage of operative cures.

Our Own Experience

Until seven years ago there was no special interest in chronic constrictive pericarditis at the Massachusetts General Hospital, though one of our own staff [8] had called attention to Pick's paper and had reported an interesting case. Rarely patients in the clinic were diagnosed as having Pick's disease—I can recall two between 1915 and 1925—but as chronically ill cases they excited no particular interest and there was *no relief for them* except for repeated abdominal taps. After the case reported by Richard Cabot in 1898 only two others came to autopsy at the hospital in the next thirty years.

On Jan. 24th, 1898, Richard Cabot,[8] then physician to out-patients at the hospital, related the history and post-mortem examination of a boy of 18 who for six years had suffered from an enlarged liver and for four years from ascites. His past history revealed nothing of importance; measles at the age of seven years had been his only illness. Cabot wrote: "Death occurred (8 weeks after entering the hospital in 1893) apparently from pulmonary œdema and exhaustion. The diagnosis at the time of death was entirely uncertain. The absence of any history of alcohol and of any history or lesions of syphilis, congenital or acquired, made cirrhosis of the liver unlikely. There did not appear to be sufficient evidence of cardiac or renal disease to explain the signs. Tubercular peritonitis seemed unlikely in view of the nature of the fluid obtained by tapping and the absence of nodules or masses in the abdomen after tapping. The sputum was repeatedly examined for tubercle bacilli with negative results. The possibility of a new growth in or near the liver and pressing on the portal radicles or otherwise obstructing the portal circulation could not be excluded, and was considered on the whole the most likely diagnosis.

"*Autopsy* showed the following: Heart of normal size; muscular substance presents nothing abnormal. Pericardium entirely obliterated by firm fibrous adhesions; in the upper part a small, cheesy nodule. Liver greatly enlarged; nutmeg surface on section. Kidneys dark red in colour, with evidence of abundant blood."

In 1925 we were confronted by a new and important patient, a pioneer who for us opened up the rich experience that has followed and who shared with Dr. Churchill the distinction of the first surgical cure of the condition in America.

CASE 1.—Miss C. S., at the age of fifteen years, entered the Massachusetts General Hospital for study on Jan. 26th, 1925. Eight years before she had for two months suffered from smothering spells, fever, a big liver, and fluid in her abdomen. Following this illness she had remained perfectly well for about seven years, that is, until the age of 14, with no cardiovascular signs or symptoms.

In March, 1924, she suffered bilateral peritonsillar infection and "smothering." Her physician again found enlargement of the liver and abdominal fluid, and for the four months before entrance to the hospital she had been in bed. In the past she had had, in addition to the illnesses noted, chicken-pox, whooping-cough, mumps, and influenza (in 1919). She had never had rheumatic fever, chorea, scarlet fever, diphtheria, pleurisy, or pneumonia, and there had been no known exposure to tuberculosis. Her family history was entirely unimportant.

On examination she appeared well developed and nourished, lying flat in bed, in no respiratory distress or pain. The right tonsil was enlarged. The lungs were clear. The heart showed slight enlargement and shifted with change in position. There was no Broadbent's sign. There was a moderately loud systolic murmur at the apex with a third sound. There were no diastolic murmurs. The liver was enlarged, the edge being palpable 6 cm. below the costal margin; it was not pulsating. The blood pressure varied from 130 millimetres mercury systolic and 80 diastolic to 95 systolic and 60 diastolic. The pulse was regular at a rate of 90. During her three weeks in the ward she had one bout of fever, up to 102° F., with a sore throat. Tonsillectomy was carried out on May 4th at the Massachusetts Eye and Ear Infirmary under gas and ether anæsthesia.

X ray examination (Jan. 31st, 1925) showed a definite increase in transverse measurements of the heart shadow, particularly to the left, with well rounded apex, somewhat increased supracardiac shadow, and rather marked increase in prominence of the lung hilus shadows on both sides. The electrocardiogram showed normal rhythm at a rate of 90 with late inversion of the T waves in Lead 1, slight inversion of the T waves in Lead 2, and prominent Q waves with upright T waves in Lead 3. The blood showed very slight anæmia and no leukocytosis. The urine, kidney function, and stools were normal. W.R. negative.

The patient was digitalised without benefit, and discharged on Feb. 17th, 1925, with a diagnosis of "chronic mediastino-pericarditis, chronic tonsillitis, ascites, and perihepatitis."

Because of increase in abdominal fluid and failure to respond to digitalis and diuretin she re-entered the hospital on June 19th, 1925. There were the same findings on examination as before except for an increased amount of ascitic abdominal distension and prominence of the jugular veins. Calomel and novasurol produced slight diuresis only, and finally on July 17th she had an abdominal paracentesis which yielded 4500 c.cm. of clear straw-coloured fluid with a specific gravity of 1·018. On culture this fluid showed no growth and inoculation of a guinea-pig was negative for tuberculosis. She was discharged on July 18th, 1925.

During the next three years she attended the cardiac clinic in the out-patient department regularly, and received digitalis and theocin. The digitalis was discontinued after a while because it in no way affected the ascites. Twice during this interval the abdomen was tapped. She lived a quiet life, unable to resume school.

In 1927 her legs began to swell for the first time, and this symptom increased considerably early in 1928. In April, 1928, she began to have dyspnœa on slight exertion and œdema of the face and upper part of the body; in May, 1928, she had to go to bed, and in June she re-entered the hospital ward following advice that I had given in a pessimistic letter which I had written to her doctor on April 27th, 1928. "She certainly has had a very miserable time and I am afraid there is not much that can be done to help her. There seems little doubt but that pericarditis is at the back of her trouble. Probably she has a good deal of mediastinal involvement and disability of the heart itself. I would suggest resuming digitalis grs. 1½ t.d.s. for a few days and then once daily for a few weeks. If after two or three weeks she is not better I would advise that she come into the hospital again with a thought of considering cardiolysis if there is any chance of freeing the heart. I suppose, however, that the prognosis is poor at best." Dr. E. D. Churchill about this time returned from study abroad which had included observation of pericardial resection in Sauerbruch's clinic. I asked him to see this girl with me, and he agreed to operate. At that time there had been no successful cases in the United States.

The patient and her family consented, and on July 18th, 1928, when she was 18 years old, she submitted to an anterior pericardial resection, which included the removal of a band compressing the inferior vena cava. A very thick pericardium was found constricting the right ventricle and right auricle and great veins. An area the size of the palm of the hand was removed. Microscopically the pericardium that was removed showed a degenerative fibrous connective tissue.

After a moderately stormy two or three days following the operation she began suddenly to improve, and a spontaneous diuresis started on the fifth post-operative day; in the course of a few weeks she lost all her œdema and ascites and her liver decreased considerably in size until the edge could be felt just below the costal border. Her weight dropped from 139½ pounds before the operation to 109 twenty-five days after the operation. Her heart murmur was barely audible.

This patient has been in excellent health and full activity for nearly seven years since her operation (she was last examined on May 16th, 1935). (Figs. 1 and 2.)

The electrocardiogram on April 29th, 1935, showed normal rhythm at a heart-rate of 65, with slightly reduced voltage of the Q R S waves, low T waves in Leads 1 and 2, and slightly inverted T waves in Lead 3; this record shows lower voltage of the Q R S waves than that before the operation, but the T waves are more normal (they were inverted in Leads 1 and 2 in 1928).

With this auspicious beginning seven years ago we have gradually accumulated our experience with 14 more cases of chronic constrictive pericarditis. The account of these patients I have arranged in several groups, beginning with the largest, namely, five others who have been completely cured by operation. Adding these to the first case, we thus have Group A consisting of six patients who illustrate well the features of the cases most amenable to treatment. Then follows one case (Group B) relieved in major part, but not completely cured, by operation. Group C contains three cases who died primarily of the lesion itself; in them the disease was unusually severe and fulminating in its course; in two of these operation probably hastened the end by a few days, while in the third our previous experience warned us of the inoperability of the condition and the patient died without operation. The fourth group (Group D) includes three cases who died of complications, a few days post-operatively in two patients and one year after operation in the third; in two sepsis was responsible (apparently unrelated to the pericardial lesion in one but directly related or superimposed in the other), and in the third true portal cirrhosis of the liver and posterior pericardial adhesions conspired to cause death. Finally, Group E consists of two living cases, older patients, one with a mild and the other with a moderate degree of constriction, not proved by operation but by characteristic signs and X ray evidence of pericardial calcification.

I shall now describe the other five successful cases.

Group A.—CURED CASES

[CASE 1.—Reported above.]

CASE 2.—Mrs. L. F., housewife aged 30, was sent to me on Jan. 9th, 1933 because of obstinate anasarca. She had always been well and active except for scarlet fever as a child, appendicitis with operation four years before, and a quinsy sore-throat three and one-half years before, at which time she was laid up for four or five weeks. Two and one-half years before my examination she began to have œdema of both feet equally, slight dyspnœa on exertion, and some palpitation, but no pain. These signs and symptoms increased gradually until a year before I saw her when the swelling had involved both legs to the hips, and also the abdominal wall and the belly itself. The dyspnœa had increased somewhat but was never prominent. For a year there had been little change in the condition. She was a semi-invalid, and had puzzled several physicians because of the failure of the dropsy to respond to ordinary remedies such as digitalis, mild diuretics, and rest. Her parents, two brothers, and three sisters were living and well. One brother and one sister had died of tuberculosis. Her one child was in good health.

Physical examination showed a slender woman with much œdema of the legs and moderate prominence of the abdomen. There was a visible pulse in the neck veins in the upright position. Her heart was normal in size; sounds good, no murmurs, but a rather loud third sound at the apex. The heart rhythm was normal and the pulse-rate 84. The blood pressure was 105 mm. systolic and 70 diastolic. The pulse was small. The lungs were clear. The diaphragm was high. The abdominal wall was œdematous and both legs showed marked œdema extending up to the hips and waist. X ray examination showed normal size of heart and aorta, with little or no pulsation of the right heart border but active pulsation of the left. The left leaf of the diaphragm was displaced upwards by each heart beat. There was a slight amount of fluid in the right pleural cavity. The electrocardiogram showed normal rhythm, rate 105, with low voltage of the Q R S waves and low T waves in all leads. The T waves in Leads 2 and 3 were slightly diphasic.

She was admitted to the hospital on Feb. 10th, 1933, and her pericardium was resected by Dr. Churchill on April 6th. The pericardium that was removed showed microscopically fibrosis but no tuberculosis. Just before operation the urine, blood, and stools were normal; the Hinton reaction was negative, the basal metabolic rate was plus 5 per cent., and the venous pressure as measured by direct method was 16 cm. The serum protein was reduced to 3·1 per cent. and 4·1 per cent. with albumin 1·5 and globulin 2·6. Following operation the serum protein measured 5 per cent.

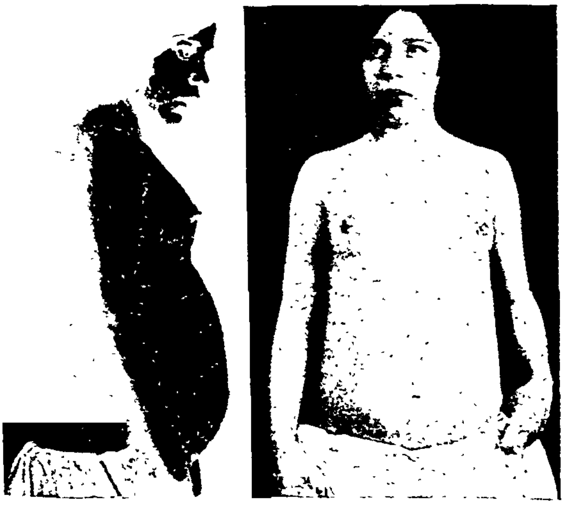

FIG. 1.—(Case 1). The patient, C. S., at the time of her disability from chronic constrictive pericarditis.

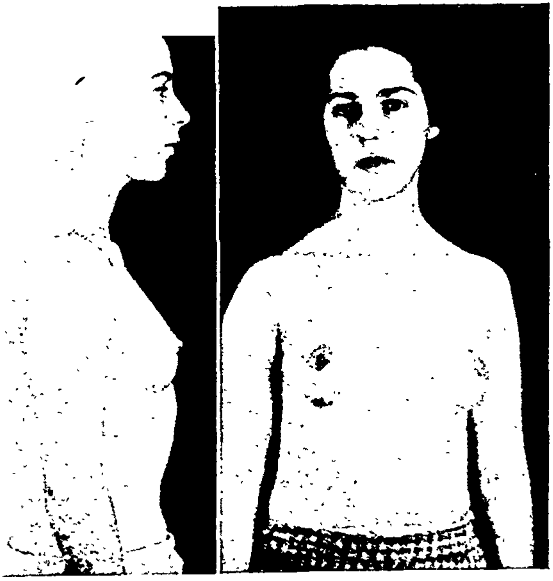

FIG. 2.—Same patient seven years after operation. Her cure, evident in these pictures, was completely effected within a few weeks of the pericardial resection.

After operation she made a rapid recovery with disappearance of symptoms and signs within one month; a spontaneous diuresis began three days after the operation and continued to a loss of 20½ pounds of œdema fluid. Since her discharge she has been in excellent health in the last two years (examined on May 16th, 1935) and has not only resumed the care of her household but has worked in a mill.

The electrocardiogram on May 16th, 1935, showed normal rhythm at a heart-rate of 100, slight right axis deviation, and slightly inverted T waves in Leads 2 and 3; this differs from the record before the operation in that the T waves in Leads 2 and 3 are inverted, and the voltage is somewhat higher, namely, within normal limits.

CASE 3.—C. A. F., male 19 years of age, entered the Massachusetts General Hospital on Feb. 23rd, 1933. Two years before he had to give up track sport at high school because of increasing dyspnœa. Six months later he began to tire very easily and three months after that, he noticed generalised swelling of his face every morning, swelling of his legs at the end of the day, and increase in the size of his abdomen. He had to rest one day a week, but kept at school otherwise. After leaving school he rested entirely for a month and improved somewhat. A recurrence of signs and symptoms caused consultation with a physiotherapist who declared that his heart was bad, and electrical treatments were advised. He improved slightly, but in the fall, six months before admission to hospital, his dyspnœa and œdema increased, and his weight rose from 156 to 164 pounds. A physician prescribed digitalis and a diuretic, and the weight was reduced temporarily. The obstinacy of the dropsy, however, finally caused his entrance to hospital.

In the past he had had chicken-pox, measles, mumps, whooping-cough, and pleurisy with bronchitis, the last named six months before he began to have shortness of breath. The family history was good, the father, mother. and three brothers being alive and well.

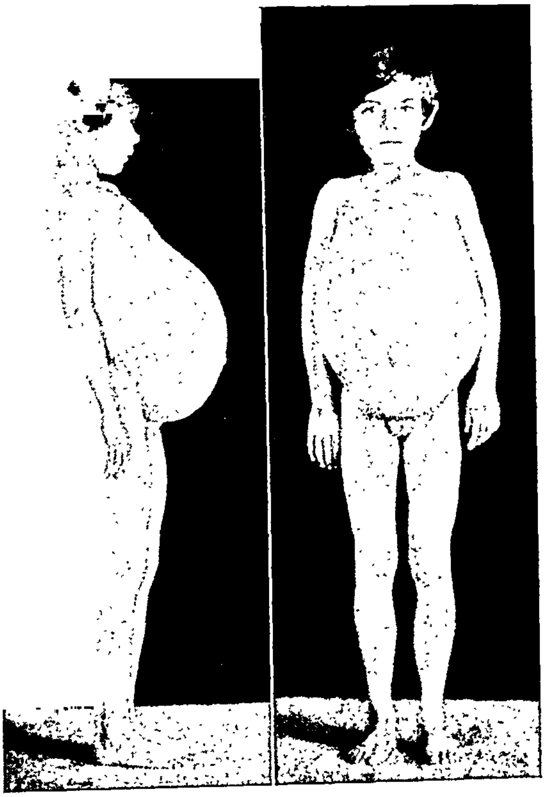

FIG. 3.—(Case 5). B. K., at the time of her disability. Her condition was unchanged for seven years (5 to 12 years of age.)

Physical examination showed a lad in no distress, but with massive pitting œdema of both legs, some œdema of the scrotum, moderate enlargement of the liver, a heart of normal size with distant sounds and no murmurs, a regular pulse of 80, blood pressure of 110 mm. systolic and 60 diastolic, and distension of the neck veins. X ray examination showed normal heart size, thickening of the pleuræ, increase of the supracardiac shadow, and no evidence of pulsation at the right heart border. The lung hilus shadows were slightly increased. The electrocardiogram showed normal rhythm at a rate of 88 with inverted T waves in Leads 1 and 2. Urine and blood were normal. The serum protein was 3·3 per cent., increasing to 4·5 per cent. soon after the operation. The liver function was diminished. The basal metabolic rate was minus 9 per cent.

On April 22nd, 1933, pericardial resection was carried out by Dr. Churchill. A thickened pericardium adherent to the heart was found and removed from the left ventricle, right ventricle, and right auricle. The diaphragmatic pericardium was resected. There was a small pocket of fluid at the diaphragmatic surface. The right auricle in the region of the inferior vena cava was decorticated. On microscopic examination the tissue removed showed fibrosis. There was a slight decrease of œdema on the third post-operative day with the onset of definite diuresis on the sixth day. His œdema and ascites were entirely gone in eighteen days during which time he lost thirty-five pounds of fluid. He has been well in the past two years since the operation (examined May 16th, 1935).

The electrocardiogram taken August 17th, 1934, sixteen months after the operation at which time the patient was well, showed normal rhythm at a heart-rate of 80, with flat T waves in Lead 1, late slight inversion of the T waves in Lead 2 (of the so-called coronary type), and moderate inversion of the T waves in Lead 3; this record shows improvement over that taken before the operation which showed inversion of the T waves in Leads 1 and 2, and lower voltage of the Q R S waves.

CASE 4.—L. C., a lad of 12, entered the Massachusetts General Hospital on June 30th, 1933 with a story of gradually increasing size of his abdomen over a period of three months. He had no other symptoms or signs, and was annoyed at having to interrupt his usual activities to be treated. Four days before admission to this hospital his abdomen had been tapped in another hospital, where calcification of the pericardium had been discovered by X ray.

He had been critically ill with pneumonia at the age of four years, had measles, mumps, and chicken-pox between the ages of four and six years, and a light attack of whooping-cough after that. His tonsils had been removed at the age of two. His father died of tuberculosis (three months before this boy was born). His mother was living and well.

Physical examination showed a well-developed but not well-nourished boy with heart at the upper limit of normal in size, good heart sounds with a loud reduplicated pulmonary second sound, and no murmurs. The blood pressure measured 90 mm. systolic and 60 diastolic. The veins in the neck, arms, and upper chest were dilated. The lungs were clear. The abdomen was somewhat distended (it had been tapped a few days before). The edge of the liver was palpable 6 cm. below the costal margin. There was shifting abdominal dullness but no œdema over the legs or lower back. There was no fever. The blood was normal except for slight secondary anæmia. Urine was normal and stools were normal. The Hinton reaction was negative. The liver function was slightly reduced. The serum protein measured 4·8 per cent. before operation and 6·4 per cent. after operation. X ray examination showed a full-sized heart with increase in the size of the great vessels and enlarged lung hilus shadows, slight thickening of the axillary and apical pleuræ, and a linear area of calcification extending around the entire lower part of the pericardium. The electrocardiogram showed normal rhythm at a rate of 85, with low T waves in Lead 1, diphasic T waves in Lead 2, and inverted T waves in Lead 3.

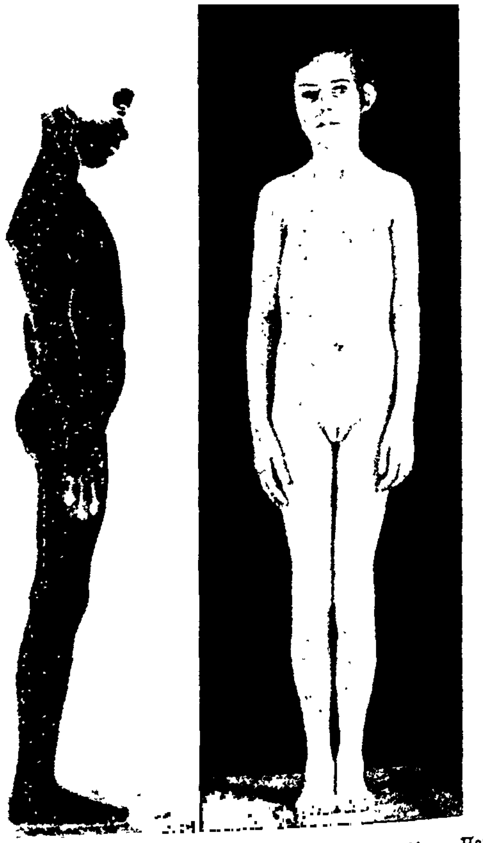

FIG. 4.—Same case one year and a half after operation. Her cure was completely effected within a few months of the pericardial resection.

Pericardial resection was carried out by Dr. Churchill on July 12th, 1933. The fourth, fifth, and sixth costal cartilages were resected as in most of the other cases. A thick hard pericardium with areas of calcification was found and resected from the right ventricle, right auricle, and inferior vena cava. Most of the diaphragmatic pericardium was also resected. The pericardium over the left auricle was not cleared. During the first two post-operative days there were vomiting and acidosis, and then rapid improvement began; spontaneous diuresis appeared on the sixth post-operative day, and continued for twelve days with a loss of eight pounds of fluid, and a shrinking of his girth from 28 to 24½ inches. He has been perfectly well since, during the past two years, and now plays all kinds of games actively, including baseball and football. (Last examination, May 16th, 1935.)

The electrocardiogram, May 16th, 1935, showed normal rhythm at a heart-rate of 70, with normal upright T waves in all leads; this record has now returned to a perfectly normal state in comparison with the record taken before the operation.

CASE 5.—B. K., a girl aged 10, entered the hospital on Oct. 13th, 1931, with a history of having lived a semi-invalid life since the age of 5½ due to a markedly enlarged abdomen resulting from the presence of much ascitic fluid. When she was twenty months old she suffered from what was apparently an attack of acute pericarditis, and her abdomen became enlarged. At the age of 2½ a laparotomy was performed and a gangrenous appendix was removed. No tubercles were seen on the peritoneum at the time of operation. A drain was inserted, and the patient made a good recovery. The fluid returned in about three weeks but following an abdominal tap one month later there was no recurrence of fluid for three years. At the age of 5½ the abdominal fluid returned, and six months later a Talma operation (omentopexy) was done. Abdominal fluid injected into a guinea-pig gave negative results. There was no improvement following this operation, and at the age of 9 the patient entered a second hospital for further study. Her abdomen was tapped at that time, but not again after that until her entrance into the Massachusetts General Hospital in the fall of 1931 when 6240 c.cm. of straw-coloured fluid with a specific gravity of 1·013 were removed.

Her mother had died of tuberculosis during the patient's infancy. Her father is living and well.

Physical examination showed a thin, somewhat pale, young girl with heart apparently normal in size and sounds and without murmurs, and with prominent jugular veins and a large protuberant, non-tender abdomen, filled with fluid. X ray examination showed heart and great vessels somewhat displaced to the right and anchored to the diaphragm; no pulsation was evident at the right border of the heart and great vessel shadow; the right pleura was thickened.

The electrocardiogram showed normal rhythm, rate 100, with inverted T waves in Lead 2.

Advice was given at that time that the chest be explored surgically and the adhesions constricting the right auricle, right ventricle, and great veins be freed.

After an interval of two years this girl returned to the hospital in an unchanged condition with persistence of the enlargement of the abdomen. The serum protein measured 4·3 per cent. X ray and electrocardiographic findings were as before.

Pericardial resection was carried out on Nov. 16th, 1933, and a moderately thickened pericardium containing calcareous plaques was removed from over the right ventricle and right auricle by Dr. Churchill. The pericardial tissue that was removed showed fibrosis and calcification on examination. There was a stormy time for two days after the operation, and during the first two weeks there was no apparent improvement. About four weeks after the operation spontaneous diuresis began and in the course of a few months the ascites completely disappeared. She has been in excellent health since, and looked well when she was last examined by us on May 16th, 1935. (Figs. 3 and 4.)

The electrocardiogram on May 16th, 1935, showed normal rhythm at a heart-rate of 80, with slightly upright T waves in Lead 1, flat T waves in Lead 2, and very slightly inverted T waves in Lead 3; this record differed from that taken before the operation in that the T waves were more normal and the voltage of the Q R S waves was greater.

CASE 6.—D. G., a schoolgirl aged 11, entered the Massachusetts General Hospital on Dec. 31st, 1934, with a history of fatigue and apathy during the previous year, and abdominal swelling for eight months. Two months after the abdominal swelling began heart trouble was diagnosed and medicine, apparently digitalis, was given. The ascites, however, persisted and occasionally puffiness of the eyelids in the morning was noted. She had been in bed most of the time for three months.

On examination she was a well-developed and rather poorly nourished girl, sitting quietly in bed, with no apparent pain or distress. She was very cheerful. The skin and mucous membranes were somewhat pale. The heart was normal in size. The sounds were good, with no murmurs, but a loud third sound at the apex. The pulse-rate was regular at 90. There was very slight elevation of temperature, 99½° to 100° F. rectal. The blood pressure was 98 mm. systolic and 70 diastolic. There was moderate distension with pulsation of the veins in the neck. The venous pressure was 21 cm. in the jugular vein. The lungs were clear. The abdomen was rounded, firm, but not tender, with shifting dullness in the flanks, and a definite fluid wave. The liver edge was palpable 5 to 7 cm. below the costal margin. The spleen was not felt. There was no œdema of the legs. There was a slight "paradoxical" pulse. The Hinton and tuberculin tests were negative. The liver function test was slightly reduced. The blood was normal except for slight secondary anæmia. The urine was normal and the stool was normal. The serum protein was 7·4 per cent. Two litres of straw-coloured fluid were removed from the abdomen by tapping. The specific gravity of this fluid was 1·016. Injected into a guinea-pig it gave no evidence of tuberculosis ten weeks later. X ray examination showed normal heart size and shape with good pulsations. There was no evidence of fixation of the heart or of adhesions. There was some increase in the shadow of the great vessels at the base to the right of the midline, with increase in the lung hilus shadows. The electrocardiogram showed normal rhythm with inverted T waves in Leads 2 and 3.

Pericardial resection was advised, and she was readmitted to hospital later, on Feb. 4th, 1935. Pericardial resection was carried out on Feb. 27th. A thick, but not calcified, pericardium, adherent to the heart throughout, was discovered and resected from the right ventricle and right auricle. Examination of the pericardium which was removed showed fibrosis without evidence of tuberculosis. She went through an uneventful convalescence except for slight right pulmonary collapse. Spontaneous diuresis began mildly on the third day, but she showed very little improvement prior to her discharge on March 30th, 1935. Since that time she has shown steady improvement at home, and to-day is in good health except that she tires easily. Her abdominal swelling has entirely disappeared.

The electrocardiogram on May 16th, 1935, showed normal rhythm at a heart-rate of 120, with slight right axis deviation, slight inversion of the T waves in Lead 2, and moderate inversion of the T waves in Lead 3, much the same as in the record before the operation.

The five cases detailed above were completely cured by operation. The next case, though not so successful, was greatly relieved by operation.

Group B.—GREATLY RELIEVED BY OPERATION

CASE 7.—J. N., aged 16, was referred to us with the diagnosis of chronic constrictive pericarditis. In early childhood he had had chicken-pox and measles; at 5 years of age a tonsillectomy was done. At 9 he had double pneumonia, and was in bed for six weeks. There was a complication of left pleural effusion and this was tapped. Cardiac enlargement and a systolic murmur were discovered then. At the age of 13 routine examination showed some cardiac enlargement with systolic murmur, pulsating veins in the neck, and enlargement of the liver, the edge of which was felt three fingers-breadth below the costal border.

When 14, during the winter of 1929–30, he noticed that his face was swollen and that he had some difficulty in getting on his waistcoat due to enlargement of the abdomen. Œdema of the thighs was developing at that time, and the liver enlarged until its lower edge reached the umbilicus. He continued at school for part time for a year and then had to give up and was living a semi-invalid life when we saw him. He had had very little dyspnœa. Diuretics were used with temporary benefit. Two months before entrance to our hospital his abdomen had been tapped and eight litres of fluid removed. Digitalis had been ineffective. There was nothing abnormal in the family history.

Physical examination showed a well-developed and moderately well-nourished young man, lying comfortably in bed, without dyspnœa, but with slight to moderate engorgement and pulsation in the jugular veins. The pulse-rate was absolutely irregular at a rate of 120, and the pulse was definitely "paradoxical." The blood pressure was 110 mm. systolic and 95 diastolic. The heart showed moderate enlargement. The sounds were of fair quality. There was a loud blowing systolic murmur at the apex; there were no diastolic murmurs. A slight third sound was heard at the apex. The lungs were clear. The abdomen was uniformly prominent. There was slight œdema over the anterior abdominal wall and over the shins. The heart shifted definitely on change in position of the thorax. The liver edge was not tender; it was easily felt, extending across the abdomen half way between the umbilicus and costal border. There were no Broadbent's sign and no clubbing of the fingers or pyrexia. The blood was normal. The urine showed the slightest possible trace of albumin with a rather high specific gravity due to his restriction of fluid intake. X ray examination showed definite enlargement of the heart in all diameters, particularly in the region of the auricles. There was increase in the supracardiac shadow, thought to be due to venous congestion. Barium in the œsophagus showed deviation to the right in the region of the left auricle. Pulsations were weak but definite. The lung hilus shadows were increased, the pleuræ markedly thickened on both sides. Electrocardiogram showed auricular fibrillation at a ventricular rate of 80 with slight right axis deviation, and inverted T waves in Leads 2 and 3.

Pericardial resection was advised, and on Sept. 27th, 1932, this was done by Dr. Churchill. A very much thickened pericardium with some calcium deposit was found and dissected off from the right ventricle and right auricle, and in part from over the left border of the great vessels. A considerable portion of diaphragmatic pericardium extending backward to the region of the inferior vena cava was removed. A considerable amount of calcified pericardium was left, but the amount that was excised allowed the heart to herniate outwards and evidently greatly increased its diastolic filling. Microscopic examination of the pericardium which was removed showed hyaline degeneration of fibrous connective tissue with focal deposits of lime salts.

His post-operative condition was satisfactory but improvement was slow. In the course of the first week the anasarca seemed to be clearing somewhat, and the cervical veins were less engorged. The venous pressure dropped from 28 cm. to 14 cm. After disappointingly slow progress and the use of salyrgan intravenously on several occasions and abdominal paracentesis he returned to his home in Oklahoma where he remained ten months. He returned to us in September, 1933, showing great improvement, but not cured. He had lost about twenty pounds in weight, but still required an occasional abdominal paracentesis. The serum protein was 4·3 per cent. The liver function showed a retention of 10 to 15 per cent. of the dye. His electrocardiogram showed auricular fibrillation with slightly low voltage and slight right axis deviation as before. X ray examination showed some calcification which had not been definitely evident before. It was thought that further pericardial resection was indicated.

On Nov. 16th, 1933, Dr. Churchill operated again with ease through the original scar, which was excised. Calcified pericardium at the base of the great vessels was removed, and the right auricle was more completely freed. The left auricular appendage was dissected free. The pericardial tissue removed showed, as before, fibrosis with calcification. There was an uneventful convalescence after this second operation but no further improvement, and on March 30th, 1934, a Talma operation (omentopexy) was done because of the opinion that the liver condition was now possibly responsible for the persistently recurring ascites. At the time of his operation a small bit of liver was removed, and was found to show only slight "cardiac" fibrosis. The liver capsule was not thickened (no "frosting" or Zuckergussleber).

There has been no distinct improvement following this operation. Frequent abdominal taps were necessary every one to two weeks until a diet very low in both salt and fluid was carried out under careful control during the past spring. On this diet which is somewhat similar to that used by the famous Finsen,[16] who had Pick's disease, there had been no gain in weight and the ascites had been so controlled that an interval of more than six weeks passed from the last paracentesis to the date of my last examination of this patient on May 31st, 1935, at which time he appeared in a fair state of health, quite active, but very dry with considerable weakness (probably from near heat prostration) on hot days—he is unable to perspire because of the marked limitation of fluid and of salt ingested (180 c.cm. of the former and 2·5 g. of the latter each twenty-four hours).

There are various indications that in the case of this young man the remaining disability results from constriction of the left chambers of the heart, especially the auriculoventricular ring, which acts much as mitral stenosis would act. The round shape and moderate cardiac enlargement by X ray examination, the presence of auricular fibrillation with right axis deviation by electrocardiogram, the X ray picture of posterior pericardial calcification, and the knowledge that the anterior surface of the heart is well freed from constricting pericardium are evidence in favour of this point of view. A further operation to clear the pericardial adhesions from the posterior wall of the heart would seem reasonable. Because of his marked improvement in certain respects, however, it has been thought wise, first, to complete a careful study as to the effect of low salt and fluid intake. In Germany a similar case has been successfully operated upon twice,[32] first, with the freeing of the anterior surface of the heart, and second, with the freeing of the posterior surface of the heart. His condition was excellent some years later.

Group C.—CASES WHO DIED PRIMARILY OF THE LESION ITSELF

In two of these (Cases 8 and 9) operation probably hastened the end by a few days; the third (Case 10) died without operation.

CASE 8.—J. M., male aged 36, mechanic, consulted his company physician on Sept. 15th, 1933, complaining of fever, slight cough, and profuse sweating which had come on acutely. His temperature was 101·5° F. The next day he felt a tightness over the lower part of the sternum. X ray examination showed an enlarged heart shadow and a provisional diagnosis of pericardial effusion was made. There was no story of rheumatic fever. He entered the local hospital and remained there three months with an oscillating temperature. A right chest tap brought fluid. He was discharged home from the hospital in December, 1933, where he remained on very restricted activity for six or seven weeks, but then he began to develop abdominal enlargement and œdema of the lower legs. He returned to the hospital on Jan. 18th, 1934. A persistence of his œdema and ascites caused his transfer to the Massachusetts General Hospital for consideration of pericardial resection for constrictive pericarditis. There was no important illness in his past history. His family history was excellent.

Physical examination on Feb. 15th, 1934, showed a very ill man with little dyspnœa but cyanosis of the lips and cold cyanotic extremities. The heart dullness was slightly increased as determined by percussion, and there was no shift on change of position. There was no visible or palpable cardiac impulse. The heart action was rapid (104), regular, with muffled sounds at the apex. There were no murmurs. The pulses were small, and faded out markedly during inspiration (a high degress of "paradoxical" pulse). The blood pressure was 106 systolic and 90 diastolic. There was evidence of right hydrothorax. The abdomen was enlarged with a considerable amount of fluid, and the liver was enlarged and tender, the edge being felt about half-way between the costal border and the umbilicus. There was no œdema of the legs while in bed. He remained under observation in the hospital from Feb. 15th until April 2nd, when he was transferred to the surgical side for operation. During this interval of six weeks there was slight fever, usually about 100° F. rectal in the evening, rarely reaching 101.° An abdominal paracentesis was done four times; the first time 5728 c.cm. of greenish-yellow fluid were obtained, the second time 5376 c.cm., the third time 1536 c.cm., the fourth time 6144 c.cm. The specific gravity of the fluid ranged from 1·010 to 1·012. The urine showed slight albuminuria. The blood showed slight leukocytosis. The blood-serum protein varied from 7·4 to 4·96. The Hinton reaction was negative. The liver function test showed 4 per cent. of the dye retained. X ray examination showed a heart shadow area somewhat greater than normal, with especial increase in the region of the great vessels, more on the right. The borders of the heart were irregular. The pulsations were weak. There was evidence of some fluid in both pleural cavities. His condition was essentially unchanged during his six weeks in the hospital, and on April 2nd, 1934, an attempt was made to decorticate the heart. The electrocardiogram showed normal rhythm, and low voltage with flat T waves in Lead I. and inverted T waves in Leads II. and III.

An extensively thickened pericardium was exposed overlying the heart which was barely pulsating; a part of it was resected. His condition became critical at the beginning of the operation and he died while still under the influence of the anæsthetic. There was no autopsy.

Examination of the pericardium that was removed showed a thickness of 1 cm. Between the surfaces, on which there were tubercles, there was a large mass of irregular friable soft yellowish fibrinous material.

CASE 9.—J. B., male aged 23, a labourer. Previously in excellent health, he began to notice easy fatiguability and weakness in the summer of 1930. These symptoms were sufficient to cause him to change his work from that of a mover to that of an errand boy. In the fall of 1930 he began to notice generalised œdema, first in his neck (his collars became too tight), then in his waist (his trousers became too tight), and soon all over, including his extremities and face. In November, 1930, he had to stop work entirely because of the generalised swelling and increasing dyspnœa and weakness. Shortly after this he had a head cold, and entered a local hospital. There the swelling largely abated, but on his return home recurred to a high degree and continued until his entrance into the Massachusetts General Hospital for study on Jan. 5th, 1931. Other symptoms were a dry and unproductive cough and hoarseness which had developed in the fortnight before admission.

Physical examination on Jan. 5th showed extensive anasarca involving face, neck, trunk, and legs. There were extensive cyanosis and marked dyspnœa and orthopnœa, with hoarse voice. The throat and tonsils were œdematous. The heart showed slight increase in percussion dullness, both to the right and to the left. The heart sounds were distant and poorly heard. There were no murmurs. There was a high degree of "paradoxical" character to the pulse. The blood pressure was 120 systolic and 100 diastolic. The pulse-rate was 90 to 100, and the rhythm was regular. There was emphysematous breathing, and sibilant râles were heard in both lungs. The abdomen was tense, and there was a marked fluid wave. On six successive days paracentesis was performed, first of the abdomen on Jan. 5th when a small amount of yellow, turbid fluid with a specific gravity of 1·022 was obtained. On Jan. 6th his pericardium was tapped and 105 c.cm. of fluid was withdrawn. There was a slightly turbid character to this fluid, and the specific gravity was 1·024. On Jan. 7th his chest was tapped on the right side, but no fluid was obtained. On Jan. 8th the abdomen was tapped again with the same result as on the 5th. On Jan. 9th the pericardium was tapped again and 95 c.cm. of cloudy yellow fluid were obtained, which later gave a positive test for tubercle bacilli after inoculation in a guinea-pig. On Jan. 10th the abdomen was tapped and 100 c.cm. of cloudy fluid, negative for tuberculosis by guinea-pig test, were removed. Finally, on Jan. 13th the chest was tapped once more and 900 c.cm. of bright yellow fluid were withdrawn. The urine showed no abnormalities. The blood examination was also normal. The sputum showed no tubercle bacilli. The Hinton reaction was negative. The venous blood pressure was 32 c.cm. on Jan. 14th.

Because of the seriousness of his illness and the failure to obtain relief by any medical measures, pericardial resection was decided upon, and on Jan. 14th, 1931, this was done by Dr. Churchill.

When the surface of the pericardium was exposed no pulsation of the heart was evident. The pericardium was much thickened (5 mm.), and when incised there was an escape of about 130 c.cm. of thin straw-coloured fluid under pressure. The inner aspect of the pericardium was covered with tubercles. The heart was small, and in no place in contact with or adherent to the parietal pericardium. An oval window approximately 3 in. in diameter was removed from the anterior surface of the parietal pericardium and a V-shaped line of resection was continued on to the diaphragmatic pericardium. The inflammatory process apparently extended around the roots of the great vessels. The heart did not dilate, either due to persistence of constriction of the venæ cavæ or to thickened epicardium.

The patient died with little or no change in his condition on Jan. 15th. There was no autopsy.

CASE 10.—Mrs. A. G., housewife aged 31, began to be troubled in the summer of 1933, by paroxysms of tachycardia, lasting from one to six hours each, associated with fatigue which had followed the birth of her son five months before. Two months after the paroxysmal tachycardia began she consulted her physician who found no abnormalities except for a slight increase in cardiac percussion dullness and a pericardial friction rub. Shortly after this a slight fever was discovered and she was sent to bed. Two weeks later she developed an unproductive cough. The fever and friction rub persisted, and she was admitted to a hospital near her home, and remained there for three months. Blood culture and Wassermann reactions were negative. There was a slight secondary anæmia. She improved somewhat and was sent home. The pericardial friction rub had finally disappeared after persisting for several weeks.

On Jan. 15th, 1934, she began to be breathless and cyanotic and on examination showed marked jugular engorgement, enlarged liver, and ascites. She was readmitted to the hospital on Feb. 1st, and fluid was found on both pleural cavities which were tapped. The pleural fluid showed a specific gravity of 1·020. The tapping on one occasion was followed by a severe attack of pulmonary œdema. On March 8th peritoneal fluid was withdrawn, showing a specific gravity of 1·020. She was discharged home in April, 1934, after having had a favourable diuresis from the use of salyrgan. During the spring and summer of 1934 she was in a rather poor state of health with gradually increasing weight due to increase in the degree of dropsy. Abdominal paracentesis was carried out twice. Salyrgan was injected once or twice a week with varying response, and Southey tubes were inserted early in October. She had been in bed most of the time with increasing dyspnœa as well as œdema.

She was admitted to the Massachusetts General Hospital on Oct. 18th, 1934, for consideration of pericardial resection. At that time she was quite ill, breathing rapidly and shallowly, with marked distension of the neck veins. The heart was little if at all enlarged, without murmurs, but with an accentuated pulmonary second sound. The rhythm was regular. The pulse was small and markedly "paradoxical." The blood pressure was 95 mm. systolic and 70 diastolic. There was evidence of fluid in both pleural cavities and there was marked ascites with great enlargement of the liver, the edge of which was felt, slightly tender, midway between the costal border and the umbilicus. There was œdema of the legs and lower back. Her urine showed very slight albumin, but no sugar or bile. The blood showed very slight secondary anæmia and a white count ranging from 9400 to 12,700.

The abdominal fluid gave a specific gravity of 1·012. Guinea-pig inoculation was negative for tuberculosis. The chest fluid was heavily blood-tinged. On one occasion when 2000 c.cm. were removed from the left pleural cavity there was severe collapse with pulmonary œdema.

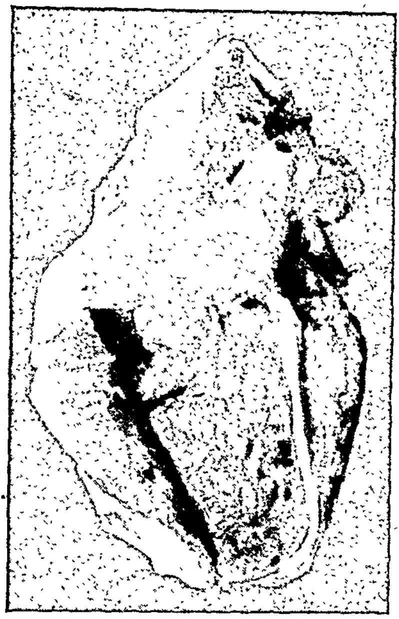

FIG. 5.—(Case 10). Heart and pericardium, showing very thick callous pericardial sac completely encasing the heart.

X ray examination showed the lower two-thirds of the heart shadow obscured by fluid in the pleural cavities, more on the left than on the right. There was no evidence of cardiac pulsation; the heart area seemed somewhat increased. The electrocardiogram showed sino-auricular tachycardia at a rate of 110 with slight left axis deviation, flat T waves in all leads, and slightly prolonged P–R interval, 0·22 second. An effort was made by paracentesis and the use of salyrgan and other measures to get her into condition for operation, but this effort was unsuccessful, and she died Nov. 15th, 1934.

Autopsy showed a markedly thickened and toughened cartilaginous pericardium, 3 to 5 mm. thick, everywhere closely adherent to the heart. A line of cleavage split off the thicker constricting parietal pericardium, but underneath the heart was still closely encased in fibrous epicardium. (See Fig. 5.) The œsophagus was involved, and the trachea also, in dense fibrous tissue continuous with the pericardium. The bronchial glands were surrounded by tough fibrous tissue. The diaphragm was adherent but not itself involved. The orifices of the great arteries and veins were not constricted. The heart itself was normal, weighing 250 g., without any disease of myocardium, valves, or coronary arteries. The aorta, pulmonary artery, and venæ cavæ were normal. The lungs were nearly collapsed and intensely congested. There was no evidence of pneumonia or tuberculosis. Each pleural cavity contained 1 litre of thin, pale yellow, slightly cloudy fluid. There was no pleuritis of any moment; there were a few thin fibrous threads. The peritoneal cavity contained about 1 litre of slightly turbid fluid, but the peritoneum was not involved. The liver showed some cirrhosis, and weighed 1500 g. The capsule was not thickened. The spleen was normal. The kidneys were congested.

We believe that this case would have been curable had we taken her on a few months earlier.

(*To be concluded*)

ILFORD MATERNITY HOME.—As many as 95 cases had to be turned away from this home last year because of lack of room. Fees ranged from £5 5*s*. to 10*s*. a week, and 474 women were admitted with only one maternal death.

OBSERVATIONS ON ANÆMIA IN THE CHRONIC RHEUMATIC DISEASES

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THE frequency with which sufferers from chronic rheumatism present the appearance of anæmia is a commonplace with clinical observers. Llewellyn Jones in 1909 [1] reviewed the results of early laboratory observations and expressed surprise that the blood changes found were so inconstant. Twenty years later, Pemberton [2] writes that "the tendency to anæmia is very definite in the 'infectious' varieties of arthritis" and suggests the importance of the condition of the blood in influencing the metabolic processes in the affected extremities. Pemberton also notes [2 3] that improvement in the arthritis, including relief from pain, often coincides with improvement in the hæmoglobin and red cell content of the blood.

Anæmia, as a symptom or as a complication of the rheumatic diseases, is important. I have repeatedly observed that anæmic patients suffer more from their disabilities than those whose blood condition is normal or nearly so. Such patients complain more of pain, general lassitude, and muscular weakness, and successful treatment of the anæmic state, even though it may be merely "symptomatic treatment," is a definite step in the alleviation of their sufferings. Unfortunately the usual methods of therapeutic attack upon secondary or "chlorotic" anæmias frequently fail in these cases. Thus of 12 patients with chronic rheumatism and a severe or moderate anæmia who were given massive doses of iron, and observed for periods up to 21 days, seven totally failed to respond and only two showed any marked improvement.

The efficiency of various therapeutic measures is at the present time being investigated. The purpose of the present paper is to record the results of certain investigations into the frequency and the nature of anæmia in rheumatic subjects, and the factors which influence its development. Kahlmeter [4] mentions that achylia is probably of no importance in the production of this anæmia; this has been reinvestigated in view of the occurrence of achlorhydria in hypochromic anæmia, as shown by Witts [5] and others. Attention has also been paid to the possibility of dietary deficiencies influencing the blood picture.

TECHNIQUE

One hundred and ninety-six in-patients of the Harrogate Royal Bath Hospital formed the subjects of this investigation. Full examination of the blood has been made on 110 patients and gastric analyses in 100 cases. Hæmoglobin has been estimated on a Sahli-Hellige hæmoglobinometer with accurate coloured glass standards; the method is probably as accurate as any other of equal simplicity. The results are recorded, for comparison with other methods, as grammes of hæmoglobin per 100 c.cm. of blood. Blood was taken from the lobe of the ear of patients three hours after a meal and never immediately after measures of physical therapy. Gastric analysis was made by means of the fractional test-meal. The meal of oatmeal was administered after withdrawal of the resting-juice and after washing out the stomach with water.

INCIDENCE OF HÆMOGLOBIN DEFICIENCY

The hæmoglobin content of the blood was determined in 124 patients (62 male and 62 female). No selection of cases was made and these cases constituted the total number of in-patients of the hospital at a certain time. It was hoped that this small number of cases would constitute a fair sample of the rheumatic population, but it differs from the far larger sample dealt with in the Ministry of Health 1924 Report,[6] in that there is a higher proportion of arthritis and especially of atrophic (infective or rheumatoid) arthritis, which constitutes 41·9 per cent. of our cases. The results of this preliminary investigation are shown in Table I. :—

TABLE I

Hæmoglobin Content of the Blood in 124 Unselected Rheumatic Subjects

—	Hæmoglobin, grammes per 100 c.cm.							
	16–17	15–16	14–15	13–14	12–13	11–12	10–11	<10
Male	6	4	16	16	16	3	1	–
Female ..	–	3	11	21	17	4	4	2
Total ..	6	7	27	37	33	7	5	2

If we accept 14 g. Hb. per cent. as the lower limit of normality, we find that 58 per cent. of the men and 77·5 per cent. of the women have hæmoglobin below this level, and 6·5 per cent. of the men and 16·2 per cent. of the women have a moderate or severe hæmoglobin deficiency (below 12 g. per cent.). This incidence of hæmoglobin deficiency is rather greater than Pemberton and Peirce [7] found to be the case among 700 army and civilian patients: an occurrence possibly explained by the higher proportion of arthritis and of severe cases in my series.

RED CELL COUNT, COLOUR-INDEX, ETC.

The red cell count in rheumatic patients is much less affected than the hæmoglobin. In no case was a hyperchromic anæmia (colour-index more than unity) encountered, and in only 24 out of 75 females and 2 out of 25 males was the total red cell count below 5,000,000. The colour-index of 100 cases varied between 0·96 and 0·49. Nucleated red cells were not met with, and reticulocytes averaged 0·5 to 1·5 per cent. of the red blood-cells. The fragility of the red corpuscles was found to be normal in six cases so examined.

ANÆMIA AND THE TYPE OF RHEUMATIC DISEASE

In order to determine whether anæmia is commoner in any particular type of chronic rheumatism, 170 cases have been classified (Table II.) according to diagnosis and the hæmoglobin content of the blood. Careful consideration has been given to the diagnosis of each case, and cases of doubtful diagnosis have not been included in this Table. The diagnostic classification adopted is given below; it follows, in the main, the more recent classifications of the American and English schools.

Group A. Atrophic arthritis of unknown ætiology, including (1) typical "rheumatoid" polyarthritis. (2) "Rheumatoid" or "infective" arthritis affecting one or more large joints. (3) Ankylosing spondylitis—Marie-Strümpell type.

Group B. Osteo- (hypertrophic or "degenerative") *arthritis.*

Group C. Non-articular rheumatism, including fibrositis, muscular rheumatism, and sciatica.

Two important points are confirmed in this Table. (*a*) Anæmia is far more common among female than among male patients, six times as many females as males having hæmoglobin below 12 g. per cent. This finding may, of course, be due in part to the lower hæmoglobin content and red cell count of the blood in normal women. (*b*) The severer grades of anæmia occur (with an incidence of pathological significance) only in the atrophic arthritis group.

TABLE II

Hæmoglobin Content of the Blood in 170 Cases of Chronic Rheumatic Disease

Hæmoglobin grammes per 100 c.cm.	Atrophic (rheumatoid) arthritis.			Osteo-arthritis.			Non-articular rheumatism.		
	M	F	M + F and p.c.	M	F	M + F and p.c.	M	F	M + F and p.c.
16–17 ..	1	–	1 (1·1)	3	–	3 (13·0)	1	–	1 (1·8)
15–16 ..	–	–	–	2	1	3 (13·0)	3	3	6 (11·0)
14–15 ..	8	8	16 (17·4)	1	4	5 (21·8)	10	6	16 (29·1)
13–14 ..	5	19	24 (26·1)	3	4	7 (30·4)	6	7	13 (23·6)
12–13 ..	7	20	27 (29·3)	3	1	4 (17·4)	7	9	16 (29·1)
11–12 ..	2	10	12 (13·0)	–	–	–	1	1	2 (3·6)
10–11 ..	1	9	10 (10·9)	–	–	–	–	1	1 (1·8)
9–10 ..	–	1	1 (1·1)	–	1	1 (4·4)	–	–	–
Below 9 ..	–	1	1 (1·1)	–	–	–	–	–	–
Total cases..	24	68	92	12	11	23	28	27	55

TABLE III

Males.	Total number of cases with—							
	No free HCl.		Hypochlorhydria.		Normal.		Hyperchlorhydria.	
	M.	F.	M.	F.	M.	F.	M.	F.
(*a*) Atrophic arthritis ..	3	23	–	5	11	23	2	2
(*b*) Osteo-arthritis ..	–	–	–	1	3	5	1	1
(*c*) Non-articular rheumatism ..	–	1	–	1	4	12	1	1

M = male. F = female.

GASTRIC ANACIDITY AND ANÆMIA

Analysis of the gastric contents by the fractional test-meal was performed on 100 cases (Table III.), on which, also, full blood examinations were made. Histamine injections were not given, but the stomach was washed out with water after the withdrawal of the resting juice.

The high incidence of anacidity among the female cases of Group A led me to investigate the influence of this upon the blood picture, and I found anæmia to be most frequent and most severe in this particular group.

It is clear from the figures in Table IV. that achylia is not a constant feature in the anæmia accompanying atrophic arthritis, and that severe anæmia may develop in this disease even in the presence of a normal acid gastric secretion.

CLINICAL SIGNS; HISTORY; DIET

A pallid or sallow complexion is common among arthritic patients, and is not always an index of the state of the blood. It is surprising how often the blood picture will be found normal, or nearly so, in such cases. Definite glossitis was present in only two anæmic patients. Painful and brittle fingernails, a common accompaniment of idiopathic hypochromic anæmia [8] is also commonly met with in atrophic (rheumatoid) arthritis, and cannot be accepted as evidence of a primary anæmic state.

TABLE IV

Hæmoglobin Content and Colour-Index in relation to Gastric Function in 53 Female Cases of Atrophic Arthritis

(Figures are total numbers of cases)

Fractional test-meal.	Hæmoglobin, grammes per cent.							
	15–16	14–15	13–14	12–13	11–12	10–11	9–10	9
Achlorhydria	–	2	10	5	5	1	–	–
Hypochlorhydria ..	–	–	–	3	–	2	–	–
Normal ..	2	4	3	4	4	3	2	1
Hyperchlorhydria ..	–	2	–	–	–	–	–	–

—	Colour-index (100 % Hb.=15·57 grammes per cent.).							
	0·90 or more	0·85 to 0·89	0·80 to 0·84	0·75 to 0·79	0·70 to 0·74	0·65 to 0·69	0·60 to 0·64	Less than 0·60
Achlorhydria	1	6	8	5	3	–	–	–
Hypochlorhydria ..	–	–	3	1	–	–	1	–
Normal ..	3	7	4	3	3	–	2	1
Hyperchlorhydria ..	1	1	–	–	–	–	–	–

The age of the patient has no influence on the anæmia. It would appear, however, that the duration of the disease is a factor in increasing the degree of anæmia. Two cases of polyarthritis, one male and one female, were admitted to the hospital within a few months of the onset of the disease and, at that time, showed a blood hæmoglobin of 94 and 90 per cent. respectively. Two and a half years later the disease was still active and the hæmoglobin had fallen to 70 in the male and 56 in the female. There was nothing in the histories to suggest a cause, other than the arthritic process, for this anæmia. It is the view of most authorities, and I agree with this, that the anæmia is secondary to the arthritis, and does not usually precede its onset.

For many years it has been customary for sufferers from rheumatic complaints to restrict or modify their diet. Many of our patients have, therefore, been asked in detail about their diet, but in only two cases with severe anæmia might this have been due to dietary deficiency. It is interesting to note that these two cases were two of the three patients with non-articular rheumatism and less than 12 g. per cent. hæmoglobin, and that both eventually responded to simple iron therapy. In both, meat had been excluded from the diet and green vegetables had been restricted for some years.

CONCLUSIONS

1. Anæmia, due to a diminished hæmoglobin content of the blood with a relatively insignificant fall in the red cell count, is common among patients with chronic rheumatic conditions.

2. Such an anæmia is far more common amongst female patients.

3. The severer degrees of anæmia are practically only encountered in cases of atrophic (rheumatoid or "infective") arthritis.

4. Although anacidity was frequently found among female patients with atrophic arthritis, deficient gastric secretion is not a constant factor in the production of anæmia in these cases. Anæmia of equal severity is encountered in cases with normal fractional test-meal curves, as in cases with deficient acid secretion.

5. There is no specific anæmia accompanying the chronic rheumatic conditions. The anæmia is a simple hypochromic anæmia secondary to the disease process.

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SIMPLE ULCER OF THE LARGE BOWEL

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ABOUT fifty cases of simple ulcer of the colon or other parts of the large bowel have been described by various writers, and some of them—e.g., Quénu and Duval, Soupault, Levy, and Barron—have added to reports of patients whom they themselves had observed an analysis of collected cases. From these accounts it is clear that the cases present themselves in two chief groups, the majority with symptoms of perforation into the peritoneal cavity, the minority with no perforation. The perforating ulcer either develops acutely (like the P.G.U. of hospital conversation) or progresses more slowly to abscess formation. The non-perforating ulcer produces symptoms and signs often not unlike those of neoplasm of the large bowel, for which indeed it has been mistaken. I propose to illustrate these groups with an account of one proved case of non-perforating ulcer and briefer mention of two probable cases of the perforating type, all personally observed. The condition has been defined by Quénu and Duval (quoted by Soupault) as "une groupe des lésions ulcéreuses ne relevant de l'action d'aucun microbe specifique, ni de l'action locale d'aucun agent chimique, et qui ne sont pas secondaire à une lésion initiale (ulcération audessus d'un rétrécissement, ulcérations du tumeurs)." In these days of advancing biochemistry the term "agent chimique" may be found too sweeping; presumably the authors meant it to apply to such chemical bodies as acids, alkalis, metals and their salts which have a caustic action.

Non-Perforating Ulcer

A single woman of 37 years had suffered for years from pains in the sacral region and all over the abdomen. During the past few months these were worse in the right lower quadrant. At the age of 18 years she had "ulceration of the stomach," and from time to time there were recurrent attacks of similar pain.

DIAGNOSIS

On March 18th, 1925, her pain began to be more severe than usual. It was felt around the waist at first and then tended to settle in the right lower abdomen though felt generally. It was described as sharp in character above and griping in the lower abdomen. Vomiting did not occur. The bowels were usually constipated, but there was an action on the day of onset of present trouble and pain had followed. Some frequency of micturition was reported. Her doctor noted a swelling in the right abdomen, and I was asked to see her on March 18th.

At my first examination, the patient moved freely in bed and did not appear to be very ill. The temperature was 100° F.; the pulse varied between 100 and 108, being of fair volume and tension. The tongue was slightly furred and moist, and no abnormality was noted in the throat or chest. The skin of the abdomen was pigmented from the frequent application of hot-water bottles. The wall moved readily on respiration but became resistant upon palpation. A tender swelling about the size of a hen's egg was made out in the line of the ascending colon, and it appeared to me to be fixed, though the patient's doctor had noted its mobility. There was a mobile retroverted uterus with cervical discharge but no other pelvic abnormality. The urine was normal on routine examination.

The patient was removed to hospital with a provisional diagnosis of appendicitis and an enema was given followed by considerable relief. The swelling, though unaltered in size, became less tender and more mobile. The temperature fell to 97° F. and the pulse-rate to 80. A barium enema was found to pass readily to a point just proximal to the hepatic flexure. A barium meal showed narrowing at the site of the swelling. A white cell count gave the following result: total 11,200; polymorphs. 69 per cent., eosinophils 1 per cent., lymphocytes 24 per cent., and large mononuclears 6 per cent. The swelling became smaller, apparently because of release of bowel contents since bowel action was fairly good. The diagnosis was, revised to that of carcinoma of the ascending colon and operation was advised.

THE OPERATION

On March 25th the abdomen was opened under gas, oxygen, and spinal (stovaine) anæsthesia. General examination having revealed no other lesion, ablation of the cæcum, ascending colon, and hepatic flexure was carried out for what appeared to be a carcinoma of the ascending colon. It was noted that the "growth" involved the inner aspect of the bowel only, and did not completely encircle it. The surface was irregular and pinkish-yellow in colour. There was little or no involvement of the lymph glands of the area. No special difficulty was met with except in the separation of the mass from the second part of the duodenum. An anastomosis between the ileum and the proximal transverse colon was made and the peritoneum adjusted over the bare area. The abdominal wall was closed in layers. After a very stormy convalescence, the patient eventually made a good recovery. During the first year following the operation she suffered occasionally from colicky pain. She has reported to me from time to time up to the present with indefinite indigestion, vague "rheumatic" pains in the body generally, such as had often been felt before the operation, and painful breasts. There is still a tendency to constipation.

PATHOLOGY

The specimen was examined after hardening in formalin. Two irregularly rounded ulcers were seen side by side on the medial wall of the colon separated by a strip of intact mucosa. The diameter of each was rather less than ½ in. The edges were sharply defined, steep, and not nodular. The base was smooth and its external surface (i.e., that away from the lumen) was irregular. Section of the ulcer showed an outline closely resembling that of a chronic ulcer of the stomach. There was a thick deposit of yellowish tissue forming the base, which thinned gradually in a centrifugal direction.

Microscopic examination showed at the edge of the ulcer an abrupt loss of the epithelium, which was infolded toward the base. The cell nuclei of the surface epithelium and mucous glands close to the edge did *not* stain well. There was much infiltration of the mucosa and submucous layer with round cells. The muscularis mucosæ disappeared close to the edge and the muscle coat was thickly infiltrated with round cells and broken up toward the ulcer. Everywhere close to the ulcer margin, polymorphonuclear and plasma cells were plentiful. In the muscular coat, a considerable number of vessels were undergoing obliterative endarteritis but the majority appeared to be quite healthy. Several had a surrounding cloud of round cells. The base of the ulcer was formed of granulation tissue, very thickly infiltrated with round cells but with relatively fewer polymorphonuclear and plasma cells.

Perforating Ulcers

(1) ACUTE TYPE

A woman 50 years, married twice (in spite of congenital absence of the uterus), suffered from colicky pain in the lower abdomen for three days. The bowel acted after castor-oil with relief to the pain, but there was a recurrence in a day or so, and the character of the pain changed. It was now severe, constant and referred to the epigastrium. More castor oil was followed by vomiting as well as purging, and the bowel acted daily afterwards though the usual habit was costive. The pain persisted and was especially bad during defæcation.

Ten days after the onset, she was admitted to hospital on the advice of my friend and colleague, Mr. James McClure. The temperature was 99·4° F. The pulse-rate 126. The patient, a stout woman, breathed with difficulty and showed obvious signs of bronchitis. The abdomen was distended, especially in left iliac fossa and left flank, and the wall was rigid. No defined mass was palpable. There was great tenderness. The external genitalia were well formed and pelvic examination confirmed the absence of the uterus. There was much tenderness in the pelvis.

The abdomen was opened by a left paramedian incision and a large quantity of purulent fluid came away from the pelvis. The appendix was merely injected externally. Coils of small intestine were matted together at the lower end of the pelvic colon and some thickening was felt in the mesentery of the latter, but no definite perforation was made out. The abdomen was closed, drainage being provided by a large rubber tube into the pelvis.

Death took place in a few days with no improvement, and a limited post-mortem examination disclosed a perforation in the lower end of the pelvic colon at first into the mesentery and then into the peritoneal cavity. The internal genitalia were apparently absent.

No microscopic examination of the affected part was made. There may be some doubt as to a single perforated diverticulum being the explanation. No other diverticula were noted and they are usually multiple.

(2) SLOWLY PERFORATING TYPE

A woman 73 years, was admitted to hospital on May 19th, 1929. On May 17th she began to suffer from pain generalised around the abdomen, settling later in the right side, where it remained. It was described as a constant dull ache, made worse by walking. There were loss of appetite, headache, and malaise, and on day of onset nausea and vomiting. The vomit was undigested food. The bowels, which usually acted only with medicine, had opened on 19th and no blood or slime had been noticed. Micturition was normal. There was slight cough with some spit.

The patient was pale. Her temperature was 100·4° F., pulse-rate 96. The tongue was dry and slightly furred. No abnormality was noted in the chest or in the nervous system. The urine was normal. A bulging was seen in the right lower abdomen, which moved well on respiration. There was slight general distension but no rigidity was made out. There was a tender fixed mass about 2½ in. by 1½ in. inside the anterior superior iliac spine, extending upwards into right loin. It was irregular in outline. No abnormality was made out in the pelvis. The urine was normal on routine examination. There was a past history of "influenza and inflammation of the bladder" three months previous to present illness. Since then there had been slight pain in the right side of the abdomen and more constipation than usual.

Upon a diagnosis of appendix abscess, a muscle-splitting incision was made over the most prominent part of the swelling and about three ounces of brownish foul-smelling pus evacuated. There was a necrotic patch on the antero-external wall of the ascending colon with a perforation in the centre. The appendices epiploicæ adjoining were swollen and œdematous. *The appendix was not anywhere visible in the abscess wall.* The perforation was infolded with catgut sutures and the abdominal wall closed around a rubber drain.

A fæcal fistula developed after several days and slowly closed. An abscess in the left parotid gland was evacuated on May 24th. The patient was discharged from hospital on July 21st. She has reported from time to time since, having developed a ventral hernia in the scar. Apart from the hernia, which is not easily controlled by a belt, the patient has since enjoyed fairly good health for her age.

There is in this case the natural doubt about the appendix having been the cause of the abscess and the operation having taken place at a time when it was about to burst into the ascending colon. A careful though not exhaustive search was made for the appendix which was not seen or felt in the abscess wall. No stercolith was discovered. There has been no sign of appendicitis since. I am, surgically speaking, reasonably satisfied that the case was one of ulcer, wanting though it may have been in the pathological or legal standard of proof.

Comment

The symptomatology is sufficiently illustrated in the above accounts. In none of the reported cases has a correct preoperative diagnosis been made. In the perforating type, the symptoms are usually ascribed to appendicitis, perforation of ulcer of the duodenum or stomach, or to diverticulitis. It may be very difficult even at operation or post-mortem examination definitely to exclude the last. There are often no symptoms previous to the acute onset of grave illness caused by the perforation, though in the abscess cases the evolution is slower. Sometimes recurrent attacks of colicky pain and abdominal distension with constipation occur and the attacks pass off with diarrhœa; perforation then takes place in a more severe attack than usual.

In the non-perforating type there is often a palpable and mobile swelling, which is diagnosed as a growth of the bowel. In Landqvist's case, however, no swelling was palpable, and in such appendicitis will probably be the favoured diagnosis with right-sided symptoms and diverticulitis with left. It is to be noted that palpable mobile swellings have usually been detected on the right side. In Mintz's case, the ulcer was situated at the apex of an intussusception of rather chronic course, which was the immediate indication for operation.

At operation, the perforating ulcer discloses itself by signs similar to those seen in *perforating ulcers* of the duodenum or stomach. The non-perforating is recognised by an area of induration and injection, covered with lymph or perhaps tending to necrosis, with a depressed centre corresponding to the ulcer crater. On the other hand it may closely resemble a carcinoma of the bowel wall, especially where there is a considerable deposit of fibrous tissue. This was the condition in Morel and Seycheron's case and in my own. In both, however, closer examination revealed that only a portion of the circumference of the wall was involved, and it is unusual at operation to find a carcinoma thus limited. The simple ulcer is often rounded, but if oval tends to spread transversely across the bowel.

Simple ulcer affects males more than females and is commonest between 40–50 years of age. It occurs chiefly in the cæcum and ascending colon, and in the pelvic colon, though any part of the large bowel including the rectum may be affected. Its size varies up to the diameter of a five shilling piece. Various suggestions have been made as to its ætiology, which has been given as inflammatory, bacterial, neurogenic or trophic, digestive or peptic, mechanical, and circulatory (from arterio-sclerosis, thrombosis, or embolus). The one common point in the great majority of the patients is habitual constipation. This, if sufficiently bad, might give rise to an ulcer mechanically by trauma, the persistence and spread being helped by bacterial action from the prolific intestinal flora. If the digestive juices survive the ileocæcal valve, there would be ample opportunity in the constipated person for their action in an acid medium in the cæcum—and the discharge from a cæcostomy in those cases where I have tested it with litmus paper has been acid. It is difficult to fit in the neurogenic or trophic factor. It may apply to the "visceroptotic" patient, but many of the subjects of simple ulcer are not of this type. In Landqvist's case there was thrombosis in the veins at the base of the ulcer; in Morel and Seycheron's and in my own, endarteritis obliterans was noted in several small vessels. The endarteritis has seemed to me to be secondary to the progress of the ulceration, and not to initiate or precede it, though Quénu and Duval express the opposite view. At present it would seem that no one ætiological view can be proved—or disproved.

The prognosis is not good, as might be expected in a condition where the usual manifestation is soiling of the peritoneum from the cæcal or sigmoid cesspool. The post-operative mortality has been as high as 50 per cent.

Surgical treatment has varied from drainage of the peritoneum, stitching and local excision of the ulcer up to extensive ablation of the bowel. It has depended upon the degree of accuracy of diagnosis at operation and the state of the peritoneum. The ideal treatment in the non-perforated case would be excision of the ulcer or of the ulcer bearing segment of the bowel with repair and proximal provision for gas escape. Closure of the opening and drainage of the peritoneum are necessities in the perforated type. Determination of the procedure to be adopted should be founded on the "safety first" principle, based upon a consideration of the local findings and the patient's general condition.

It is a pleasant duty to acknowledge my indebtedness to Dr. H. H. Sanguinetti, who was responsible for the pathological examination in Case 1, and to Mr. James McClure, assisted by whose advice I operated upon Case 2.

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OBSERVATIONS ON CHOREA

THE ENVIRONMENTAL FACTOR

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Late last summer I found myself in possession of clinical notes of over 200 cases of chorea, personally observed in hospital or private practice. I was greatly depressed by the severity and chronicity of this disease and by our ignorance of its cause and cure. When I began to reflect upon its incidence several generalisations became clear:—

1. Chorea has always been common in Sunderland, but it is quite rare in the airy uplands to the south and west of the town. And it is distinctly rare in the lovely grassy valleys to the south and west of Darlington.
2. There appears to be a definite relationship between population-density and chorea.
3. Chorea is quite uncommon in Children's Homes and similar institutions where sound wholesome food, regular meals, and punctual hours of sleep prevail.

I have been able to trace 188 patients and make complete inquiries, on a formal plan, respecting medical and social states, diet, housing, environment, temperament, and a good many similar matters. The children for the most part were typical specimens of what Vining[1] calls the "debilitated child," but most of them were pleasant and gentle. All except 7 came from lowly homes. Boys numbered 62 and girls 126, and the age-incidence rose steeply to a maximum at eight years, afterwards falling slowly, with a small secondary peak about puberty. The onset of chorea was maximal in December and January and minimal in July, August, and September.

My inquiries into the present state of the patients gave the following results:—

Dead from endocarditis	3
Found to have organic heart disease	21
Subject to a single recurrence of chorea ..	28
Subject to several recurrences	17
Subject to residual restlessness	16
Total	85

Many others were found to be in indifferent health of one sort or another, to which irrelevant factors contributed.

CAUSATION

I agree with other writers that there is no physical criterion of a liability to chorea; but the following information bearing on causation was obtained.

Previous definite and considerable disease of the tonsils	29
Excessive carbohydrate in the diet	39
Provocative illness, such as scarlet fever ..	10
Imitation, alleged on good grounds	1
Family history of chorea	6

There is one ætiological factor which I cannot reduce to statistical form; but from discussions with the parents and from domiciliary visits made by my helpers I am sure it should be emphasised. That factor is a lack of fresh milk in the child's diet. I came to this conclusion before I was aware of the work of Stephens,[2] Warner,[3] and Mutch[4] on calcium deficiency in this disease. Another highly important factor is previous prolonged general poor health and catarrh.

As regards social environment the following facts may be noted. In 60 cases the patient came from a family in which there were six or more children. In 19 cases one parent was dead or otherwise missing, and in a further 23 one parent was odd, eccentric, or invalid in some way. Damp and draughts were conspicuous in the homes of 40 children, and in 44 cases reports of serious noise were sifted and checked, e.g.—

"In the tenement flat above are 10 children."
"Neighbours very noisy all night. Much fighting."
"Neighbours upstairs hold prayer-meetings every night."
"Very noisy street swarming with children."
"House very noisy until 1 A.M."
"Lives over a wireless shop."

In 31 cases serious and astonishing overcrowding was found, e.g.—

"Six persons living in one room with two beds."
"Three rooms, all below street level."
"One lavatory for 30 persons."
"Family of 9, four rooms; dark, damp, and verminous."
"Two rooms for family of 9. Lying low near the river."
"One lavatory and one tap for 25 persons."

In 65 cases the patient came from a family living seriously below the level of subsistence when food, rent, and transport are taken into account. Here is a selection of family budgets:—

No. in family.	Total income.	Rent.	No. in family.	Total income.	Rent.
6	34/–	8/3	7	30/–	6/–
4	35/6	11/6	6	32/–	6/–
8	37/3	13/10	6	32/–	6/9
6	37/–	4/9	5	42/–	8/6
4	35/–	6/–	8	45/–	12/6
3	18/–	4/6	4	22/6	8/3
6	34/–	13/–			

Emotional factors were investigated, but the figures probably are low because all information was rejected if it could not be checked independently.

Serious and prolonged deprivation of sleep ..	37
Exposure to a premature religiosity	9
Exposure to inordinate affection	19
Exposure to notorious and prolonged family jars	6
Personal and peculiar anxiety or fear	10

There are other emotional factors of which I feel convinced but which I cannot present in statistics. Thus I believe that chorea is apt to occur in a child upon whom family and domestic responsibilities are prematurely thrust.

For one cause or another the patients of this review were long victims of generally lowered bodily health and obvious debility, anorexia, and catarrh. As a rule the parents could not attribute the onset of the disease to any single event; but a few records were secured, as follows, in which the onset seemed to bear a close relationship to particular events or stresses.

(*a*) Physical injury on trauma .. .. (e.g., scald, lacerated scalp, injuries in a fire, severe caning at school, and dog-bite.)	26
(*b*) Emotional strain .. .. (e.g., excitement of getting work as a maid, fright in the swimming baths (3 cases), "too much education" (3 cases), scholarship attempts (2 cases), suddenly startled by noise, and aroused out of sleep-walking.)	16

These figures are very much smaller than I would have expected.

CLINICAL SIGNS AND TREATMENT

I am aware of sundry classifications of chorea but I venture to suggest a further description of the types as follows: (1) "Always fidgeting." (2) "Makes faces." (3) "Keeps dropping things." (4) "Gone off her feet." (5) "Won't talk." (6) "Keeps wriggling about." (7) "Right bad with her nerves."

The only treatment I found effective was quiet and rest in hospital with competent sympathetic nursing. I am no believer in treating choreic children by stern seclusion behind screens. On the contrary I am quite sure that these patients sigh and pine for a good deal of attention. Chorea makes a child touchy and unstable, and the illness may be prolonged if she feels she is in any way of less importance than the others in the ward.

My patients were almost uniformly obedient, passive and quietly content in hospital. They appeared to have good appetites but were prone to constipation. I think severe cases recovered more quickly than mild cases but this is an impression which I have not been able to confirm.

I am much indebted to Miss W. H. Redmond, formerly house physician in the Sunderland Children's Hospital, and also to Miss McPherson, lady almoner, for valuable help.

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Clinical and Laboratory Notes

BLACKWATER FEVER IN A NEGRO CHILD

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IN a hyperendemic malarial region such as the Central Congo Forest native children either die of malignant malaria or gradually reach the condition called *prémunition* by Edmond Sergent—more generally known as "tolerance" by English malariologists. This progressively acquired freedom from febrile attacks, although parasites are still present in the blood and are frequently reinoculated by mosquitoes, goes hand in hand with an immunity from blackwater fever.

That natives from non-malarial regions are subject to severe fevers and blackwater when removed to endemic zones is well known, but among those who have acquired tolerance from childhood non-susceptibility to blackwater fever has until lately been regarded as almost absolute. Recent evidence has shown, however, that under certain conditions this protection may break down, and the following case with which I can find no parallel in my experience or in available records is an instance of this breakdown.

The patient was a boy, aged 2½, of full-blooded negro stock. For first eighteen months of life he attended the infant welfare clinic at Yakusu Hospital, and received the routine weekly dose of 0·04 to 0·10 gramme of quinine hydrochloride in solution. He had further quinine intermittently during and after this time when feverish.

Attack of hæmoglobinuria.—After two days' fever at his village he was brought to hospital on Feb. 5th, 1935, and was given a dose of 0·08 g. of quinine. Next day he passed normal urine at 6 A.M. and went with his mother to the market, where the passage of dark red urine was noticed. The parents had the sense to collect about 75 c.cm. in a tin and bring it to hospital. The child's condition was good: the temperature was 37·5° C. and the spleen three fingers-breadth below the costal margin. The urine was dark red and acid, and contained 0·7 per cent. of albumin; the deposit showed very scanty red cells and numerous granular and epithelial casts. Chemical tests for hæmoglobin positive. The blood showed malarial pigment in monocytes but no parasites.

Treatment and progress.—Copious drinks of 2½ per cent. solution of sodium bicarbonate were given. The next passage of urine was practically normal and next morning only a trace of albumin was left. On the third day a similar dose of 0·08 g. of quinine was given without untoward results. A week later scanty schizonts of *Plasmodium falciparum* were found in the blood. Two months later the child was well, the spleen now being only one fingers-breadth below the costal margin.

It is difficult to escape the conclusion that in this case hæmoglobinuria was definitely precipitated by the dose of quinine, given during a febrile period, to a child whose tolerance to malaria had been retarded by frequent quinine medication. *P. falciparum* and *P. malariæ* are the commonest parasites, *P. vivax* and *P. ovale* also occur in this region. The splenic index in the neighbourhood is 100 at the age of 2–3. Infant mortality is computed at about 500 per 1000, and is mainly due to pneumonia or diarrhœa complicating the frequent malarial attacks of the first two years. Intense infection with *P. falciparum* is often responsible for sudden death.

Mortality among the clinic babies is less than 150 per 1000 and we attribute this result mainly to the assistance of the regular weekly (occasionally more frequent) dose of quinine, which helps them to tide over the dangers attending the acquisition of tolerance. In the last ten years over 1000 babies have attended the clinic and this is the only case in which hæmoglobinuria has been observed. The disease is of course unknown to local inhabitants.

From the Katanga copper mining areas Leclef[1] and de Decker[2] have reported 28 cases of blackwater fever with 3 deaths among natives whom they state came from regions where malaria is endemic. Leclef attributed his cases to the unaccustomed dose of 1 to 2 g. of quinine, and in de Decker's 17 cases quinine had been given to his knowledge in all but 4 before the onset of the blackwater. He considers however that liability to blackwater was due to the predisposing causes of debility among bush natives working in industrial conditions.

There seems to be little doubt therefore that, both in adults and children of the negro race, the irregular use of quinine, especially in moderate or large doses during a febrile period, can precipitate hæmoglobinuria, just as it does among Europeans and Asiatics. There is no indication however that the generally accepted opinion as to the value of regular prophylactic quinine in assisting the acquisition of tolerance to malaria should be modified. That it may retard it, both among blacks and whites living in bush conditions in endemic areas, is quite possible. But the attendant dangers of pernicious attacks and later of blackwater fever are much diminished by its use.

ANURIA TREATED WITH SPINAL ANÆSTHESIA

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HON. GYNÆCOLOGICAL SURGEON TO THE HOSPITAL

IN the following case a young man had signs of intestinal obstruction after appendicectomy and subsequently developed anuria. The latter was relieved by spinal anæsthesia, and the case is reported because it may throw light on anuria occurring in other conditions—e.g., after labour or prostatectomy.

A well-made young farmer of 25, after his third attack of appendicitis, had his appendix removed on May 29th, 1932. Battle's incision was chosen, and the operation was difficult. The cæcum could not be delivered, and the base of the appendix was displayed only after enlarging the wound. The appendix passed over the brim into the pelvis, to the wall of which it was adherent: it ended in an indurated mass, thought to be an enlarged gland, with which it was removed. A rubber tube was inserted and the wound closed. The distal mass consisted of coils of the appendix; and from a raw area present it seemed that the tip had been left behind.

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[1] Leclef: Ann. Soc. belge de méd. trop., 1931, xi., 293.

[2] de Decker: Ibid., 1932, xii., 213.

The next day (May 30th) the abdomen was fuller than expected, and there was a good deal of hæmorrhagic discharge from the wound. On the 31st the abdomen was distended and tender; vomiting occurred; enemata were ineffective. The drainage-tube was replaced by a larger one under spinal anæsthesia; it was hoped this would relieve the abdominal distension, but an enema given later produced little result. On June 1st the bowels were well opened, but the abdomen remained distended, though the vomiting had stopped. The hæmorrhagic discharge from the wound increased; chlorine dressings were applied; there was no suppuration.

On June 2nd the wound was irrigated with dilute chlorine solution, and the irrigation was repeated several times—possibly under pressure, which had not been desired. In any case the condition of the abdomen got worse, and on June 4th it was explored medianly. The small intestines in the lower abdomen were found matted together and covered with a thin layer of blood; there was no adhesion to the parietal peritoneum. Douglas's pouch was cleaned out, necrotic material being removed. No attempt was made to unravel the agglutinated intestines; a large drainage-tube was inserted and the wound closed. On the 6th both tubes—the median and the lateral—were removed, reliance being placed on fomentations, radiant heat, and general nursing.

During the next ten days the patient passed through a critical time. The abdomen was very distended and tense, vomiting frequent, and enemata of little effect. The distension became so great that the wounds began to give way and coils of intestine appeared at both of them; thick pus was now freely discharging from the lateral wound, where the cæcum came to view. As a result of treatment the vomiting diminished, fæces and flatus were passed in small quantities, and the abdominal distension gradually became less, but not uniformly. The prominence of the lower right quadrant of the abdomen proved on palpation to be an indefinite mass, consisting of dilated and adherent small intestines. On June 15th the patient was so improved that a little solid food was allowed. The next day an injection of pituitrin followed by an enema produced a good fæcal result. On the 20th the abdomen was flaccid except in the right ilio-umbilical region, where the prominence persisted. The urine was free of albumin and slightly acid; it had a specific gravity of 1014.

Improvement continued slowly, pain and distension recurring occasionally. On July 12th the patient was allowed out in a spinal carriage. The same evening he vomited and complained of abdominal pain, but passed a good night. On the 13th abdominal pain persisted all day, getting gradually worse (4 P.M.). He vomited twice. Twelve ounces of urine were passed in the morning, difficulty and frequency of micturition appeared, and from 2 P.M. to 8 P.M. only one ounce of urine was passed. Heat was applied to the abdomen without advantage. At 8 P.M. the temperature was 100° F.; the patient was very restless and looked ill. Pain, flatulence, and vomiting prevented sleep until 2.45 A.M., though atropine gr. 1/100 and omnopon 0·5 c.cm. had been given at 11 P.M. Up to 8 A.M. no urine had been passed.

During the morning (July 14th) vomiting of green material persisted, but in the afternoon the patient slept. Heat to the body continued. At 6 P.M. the temperature was 101°; an enema without result. One ounce of urine was passed during the day, and on boiling it became solid. At 10 P.M. the blood pressure was 145 systolic, 105 diastolic. Spinal anæsthesia was induced, 1·9 c.cm. of tropacocaine being injected after some cerebro-spinal fluid had dribbled away. Sims's position, foot of bed on blocks. Fluid intake limited to three pints per 24 hours. At 2.45 A.M. a castor oil and turpentine enema, followed by a simple one, caused a good deal of flatus to pass. At 3 A.M. abdominal pain still present; atropine and omnopon repeated.

At 8 A.M. the next day (July 15th) the patient's condition appeared slightly improved; but the anuria persisting, the spinal anæsthesia was repeated (9.15 A.M.). The result was magical. At noon two ounces of urine were passed, containing much albumin (Esbach, 4·75), and at 3.30 P.M. a further thirteen ounces. This latter was of amber colour, clear, specific gravity 1010, showed only a trace of albumin, the Esbach being nil. At 5.45 P.M. three more ounces were passed, but at 9.45 P.M. only three drachms. During the afternoon nearly a pint of water with glucose had been taken; an enema had given only a slight fæcal result, and for the first time a fæcal leak appeared at the lateral wound. The night was more comfortable. No vomiting, but no urine. Bowels not opened, but a good deal of fæcal matter was discharged from the lateral wound.

The next day (July 16th) was one of anxiety; happily the blood pressure gradually fell; at 8.40 P.M., 136/98. At 1.20 P.M. an enema gave no result but mucus; there was considerable pain in lower abdomen, and hot bottles were still applied to abdomen and feet. Up to 8 P.M. no urine had been passed, but at 8.20 P.M. ten ounces were voided. During the night seventy-two ounces of urine were passed (12 hours), although there had been no obvious œdema.

From this time on the patient steadily improved. On July 17th the blood pressure was 135/98. There was still abdominal pain. Enemas were given four-hourly. At 7 P.M. there was a good fæcal result; fæces were still coming from the lateral wound, but gradually diminished. During the twenty-four hours 106 ounces of urine were passed. On the 18th the temperature was 100°. Barium was injected into the sinus of the lateral wound under some pressure and the abdomen radiographed. A large barium-filled space in the pelvis with divarications appeared, the barium being apparently mostly extra-intestinal. An enema at 7 P.M. produced formed fæces. Urine 30 ounces. Abdomen not distended. Blood pressure 130/98.

The further progress of the case was uneventful. There was no more vomiting. The bowels were opened naturally; a normal amount of urine, free from albumin, was passed. By July 25th the original wound had granulated over and the midline wound was healed. On August 26th the patient was discharged. The abdomen was flat, though there was occasional leakage from the lateral wound. A Curtis abdominal support was fitted after a few days. Three months later the patient looked extremely well and had gained two stones in weight. The urine was normal.

On May 9th, 1934, he was leading an active life as a milk roundsman. The median scar was in good condition; the lateral scar was considerably stretched, but there was no hernia, though a weakness could be felt on coughing. He wears his Curtis belt all the time. Urine again normal.

REMARKS

1. If at the start this man's abdomen had been opened in the middle line all the troubles which ensued would have been avoided. 2. Unfortunately, plastic peritonitis, limited to the right lower quadrant of the abdomen, with acute intestinal obstruction developed. 3. As a result of the straining and vomiting a block in the renal circulation occurred, producing anuria. 4. This was attributed to a congestion of the medulla of the kidneys, mechanically caused. 5. The choice of treatment for this condition is between decapsulation of the kidney, venesection, and the exhibition of some drug which greatly lowers the blood pressure. 6. Spinal anæsthesia was chosen for two reasons. First, it greatly lowers the blood pressure, and would thus relieve congestion of the renal medulla and allow the cortical activity to begin again. Secondly, it increases peristalsis, by which it was hoped the obstruction would be overcome—at least temporarily. 7. Put to the test, it more than met our expectations. Although but two injections, separated by twelve hours, were given, both the anuria and the gut obstruction were overcome. A recurrence of the anuria indeed looked likely, and perhaps it would have been better to have given a third injection after a further twelve

hours. The renal function however became fully re-established. The intestinal obstruction was completely and permanently overcome. One can only believe that the barrier was somehow broken down, a short circuit perhaps being produced: only in such way can one explain the absolute cure of this condition. 8. Suppression of urine in man is too often fatal. To restrict the fluid intake is easy; to induce a spinal anæsthesia requires but little skill. It is evident that in combination they may be capable of relieving anuria provided it is not due to long-standing disease or to blockage of the ureters.

AURICULAR FIBRILLATION AFTER EMETINE INJECTION

By Ibrahim Abdel Sayid, M.D. Cairo
MEDICAL SPECIALIST, BANI-SUEF HOSPITAL, EGYPT

Emetine injected into a vein weakens the heart's action and induces a fall of blood pressure, but when it is injected subcutaneously or given by the mouth the heart is not affected directly. In his "Pharmacology and Therapeutics," Cushny states that in the frog emetine causes a slowly advancing central paralysis; the contractions of the heart are rendered weak and irregular, and eventually cease from paralysis of the cardiac muscle. In the two following cases the drug appeared to induce auricular fibrillation on subcutaneous injection.

Case 1.—A woman, aged 40, had suffered from amœbic dysentery for two months. A year previously she had had acute rheumatic fever, complicated by endocarditis, and on examination she was found to have an organic systolic murmur over the mitral area, with moderate reduplication of the second pulmonary sound; the left border of the heart was at the nipple line. Pulse-rate 82; blood pressure 120/80. The heart was fairly compensated. She was given emetine hydrochloride 0·02 gramme with strychnine, subcutaneously, each day for six days. Two days after the last injection the auricles fibrillated. Her condition was very bad, but the heart was restored to normal rhythm with digitalis in ten days. Later the treatment of dysentery was completed with Yatren and emetine-bismuth-iodide pills.

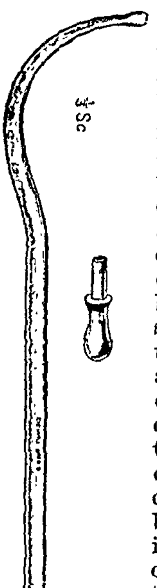
Case 2.—The patient, a man aged 50, had chronic amœbic dysentery. When examined on Sept. 24th, 1934, he showed no signs of cardiac lesions. He was given one grain of emetine hydrochloride plus one milligramme of strychnine daily for six injections; then a course of yatren pills and enemata for ten days; and finally six more injections of emetine. He developed a very bad attack of auricular fibrillation. Normal rhythm was restored with digitalis and quinidine sulphate, but the patient was in bed for about three months, and when I last saw him, in February, the pulse-rate was over 100 and there were signs of myocardial degeneration.

I have observed palpitation and dyspnœa in other cases after emetine, and though the use of this drug is almost indispensable in amœbic dysentery its depressant action on the cardiac muscle is far from negligible. It should therefore be given with great care and only under strict medical supervision.

NEW INVENTIONS

A COMBINED URETHRAL DILATING BOUGIE AND CATHETER

The bougies here illustrated have the shape of the well-known Lister's bougies and in addition each bougie has a narrow tubular channel running through its long axis; they are made in three sizes, 4/7, 6/9, 8/11 Eng. gauge. The bougies are made of brass, nickel-plated, and are designed to obviate the necessity for a metal catheter, in dealing with that common surgical emergency, acute retention of the urine from a urethral stricture. As every surgeon knows, the passage of a bougie through a stricture is much easier than the passage of a metal catheter, even though the stricture has been first dilated by the bougie. The slow emptying of the bladder through the narrow channel in the bougie is an added advantage in this type of case. To the comparatively inexperienced worker, the flow of urine through the channel in the bougie is welcome confirmation of the successful passage of the bougie into the bladder. The bougies have proved very satisfactory in practice, as they are passed more easily than a metal catheter owing to the greater weight, better balance, and their bulbous ends, and I also prefer to use them instead of a metal catheter in cases of enlarged prostate, where occasionally it is necessary to use a metal catheter to relieve acute retention.

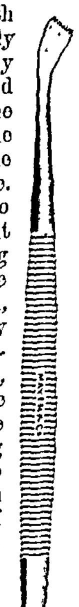


The set of bougies was made to my design by Messrs. Down Bros., London.

Milroy Paul, F.R.C.S. Eng.

A NEW TONSIL DISSECTOR

The dissector, here illustrated, designed for the enucleation of tonsils, has certain advantages, and has demonstrated its usefulness in routine hospital practice during the last year. The smooth tapered end is orthodox, being slightly curved, with semi-sharp edges, used solely for the purpose of incising the reflected mucous membrane of the tonsil, freeing the anterior pillar, the upper pole, and the posterior pillar in turn, preserving the pillars intact, and displaying the capsule. The reversed end is flattened and also slightly curved, terminating in a straight row of very fine serrations, the sides being smooth and semi-sharp. The serrated edge rests on, and is kept close to the tonsil, using it to separate the tonsillar bed gently away from the tonsil. Trauma and subsequent after-pain is reduced to a minimum, as it is impossible to injure the bed of the tonsil, and each movement that is made accomplishes its object, especially avoiding as far as possible repeated attempts to overcome the tough fibrous tissue in adults, who have had several attacks of inflammation, or quinsies. Also, incidentally, the length of anæsthesia is shortened. Hæmorrhage rapidly ceases, in most cases without ligaturing, and a smooth tonsillar bed remains. The dissection of tonsils in children is rapid and easy, with freedom from shock and post-operative bleeding.



Messrs. Mayer and Phelps, of New Cavendish-street, W., have kindly made this dissector for me.

E. Gwynne-Evans, M.B., B.S. Lond.

REVIEWS AND NOTICES OF BOOKS

Principles and Practice of Preventive Medicine

Edited by C. W. HUTT, M.A., M.D., M.R.C.P., D.P.H., Medical Officer of Health, Borough of Holborn; and H. HYSLOP THOMSON, M.D., D.P.H., Medical Officer of Health, County of Hertford. London: Methuen and Co., Ltd. 1935. Two vols. Pp. 1688. £3 13*s.* 6*d.*

THE publication of a comprehensive and authoritative work on preventive medicine from the British standpoint has been long overdue, and the two volumes edited by Dr. Hyslop Thomson and the late Dr. Hutt will not disappoint those who have been eagerly awaiting such an event. While the whole field of medicine and surgery is in one sense preventive, the term "preventive medicine" in the present book is restricted to what is commonly known as public health and hygiene, with the additions which a widening view has tended recently to include. Thus the older practitioners of public health might feel astonished at finding chapters on malignant disease, electricity and radiology, town and country planning, heredity, and hygiene in aviation in a book on preventive medicine, yet, with the possible exception of the 25 pages on electricity and radiology, no one would now cavil at their inclusion.

The book consists of 50 chapters, each on a distinct aspect of preventive medicine, contributed by 47 authorities on their respective subjects. It has been well coördinated by the editors and does not give that impression of diversity of aim and lack of balance so often found in composite books. The law dealing with each subject is collated at the end of its section and main references for further study follow each chapter. With a single exception (the ventilating fan on page 983) all the illustrations are good and to the point. Noteworthy chapters are those on infection, epidemiology, and immunity, by E. H. R. Harries—although perhaps the subject of bacteriophage is given undue prominence; on water and particularly on the hygiene of swimming baths, by Prof. J. W. Wilson; on refuse disposal, by G. Clark Trotter; on heredity, by Prof. F. A. E. Crew and Fraser Roberts; on insects and vermin, personal hygiene, and popular education in health, by the editors.

There are few omissions and still fewer misstatements. No mention seems to have been made of electric fires in the section on heating, nor has the importance of excluding "totters" and other trespassers from refuse dumps been alluded to in discussing refuse disposal. The paragraphs on the domiciliary treatment of poor-law patients might have explained more fully the various terms of service under which district medical officers work, and the maternal mortality-rate is not mentioned in the chapter on vital statistics nor is it defined, or the possible fallacies in it discussed, in the otherwise excellent chapter on maternal welfare. It is unfortunately not yet true that "*most* local supervising authorities provide post-graduate classes for midwives free of charge." Slips in proof-reading are remarkably few. The index, which occupies 109 pages of small print, makes reference both pleasant and easy.

This book will take its place as a standard textbook on public health and no medical officer of health can afford to be without it. To those whose appetite may have been stimulated by the lectures on the preventive aspects of medicine at King's College Hospital, which appeared in our columns for the greater part of a year (Oct., 1933–June, 1934) and were later published in book form, it will provide a most satisfying meal.

The Crippled and the Disabled

Rehabilitation of the Physically Handicapped in the United States. By H. H. KESSLER. Columbia University Press. London: Humphrey Milford, Oxford University Press. 1935. Pp. 337. 20*s.*

Dr. Kessler, though it does not appear on the title-page, is medical adviser to the New Jersey Rehabilitation Commission and to the Workmen's Compensation Bureau, and his book is a much more comprehensive survey than its title suggests. It attempts to outline critically the methods of dealing with all types of the physically and mentally unfit which have developed in modern times both in the United States and in Europe. The subject is divided into groups of the disabled—children, the industrially disabled, the chronically disabled (that is, those suffering from chronic disease), the war cripples, and the group of defects of special senses, and in each group the development of methods of treatment and of "rehabilitation" is studied in detail. There is a wealth of material which has been laboriously collected and ably presented, while the legislative details for the various States given in an appendix will greatly help the student.

The book condemns the social prejudice against the disabled. The term "disabled," Dr. Kessler writes, "is used to designate several groups of persons who are definitely handicapped in their effort to make a living because of physical disabilities of one sort or another." And he claims that we are all under a false impression as to what constitutes disability. "There is no such entity as a normal person, and many persons who are looked upon as disabled are by no means less capable of meeting the economic and social requirements of life than many apparently healthy persons." If this is meant to imply that because functional capacity does not prove organic health (which is admitted) organic disablement therefore does not prove functional limitation, we think the logic is faulty and unlikely to provide a satisfactory basis on which to work out large schemes for the disabled. While we are all in sympathy with the suggestion that it is the duty of the able-bodied to care for the well-being of those less fortunate, we cannot think that it is either economically possible or socially desirable, especially at the present crisis, that the disabled should be provided with work at the expense of those who are physically fitter. Work is no doubt the best stimulus, physical and mental, to the partially incapacitated; their morale suffers if they feel they are handicapped by the fact of disease or disablement, and they tend to develop (to use an Adlerian term) an "organ inferiority." But where it is a question of competition, it may be even worse to deprive an able-bodied man of his job; he is just as liable to feel inferior if he has no work, especially if replaced by one obviously less "fit" than himself. In particular does this apply to elderly people with chronic disease, who have had their good days, and to those suffering from incurable and progressive conditions. We may regret their disability, and yet feel that the needs of the community are better served by caring for and protecting these people rather than by allowing them to compete in the open market. In contrast to this no one will fail to approve all the measures described as existing, or suggested as possible, for bettering the condition of the child cripple. Here the ultimate goal is the production of self-supporting citizens, and this can only be achieved by the combination of careful physical treatment, special education facilities, vocational training, and (last and most important) the "placement facilities and a method of close follow-up" which Dr. Kessler finds in London and not nearer home.

An interesting comparison is drawn by the author between the methods of dealing with the disabled. In the U.S.A. there is a wealth of legislation, the law and the State provide for the industrially or war disabled all along the line; he passes out of the hospital ward at an early stage into a congeries of other centres and agencies. The haphazard measures of this country are dismissed by the author in the sentence "The compensation laws of Great Britain contain no provision for rehabilitation. Such activities are carried on by private and philanthropic schemes," and he remarks "The United Kingdom does not have a compulsory employment act for disabled workers." It is true enough that services of this type have developed here on voluntary lines, but they are not any the worse for the element of personal service. The U.S.A. may be congratulated too on such voluntary associations as the Goodwill Industries which started in Boston from small beginnings and has developed far-reaching and self-supporting workshops which provide employment for many disabled. Similar to it is work of the Winifred Masterson Burke Relief Foundation, whose eleventh biennial report, just received, is testimony to the completeness of its equipment.

Medical Annual, 1935

Edited by H. LETHEBY TIDY, M.D., F.R.C.P., and A. RENDLE SHORT, M.D., F.R.C.S. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. *Pp. 596. 20s.*

Medical Annual General Index and Review, 1925-34

Same publishers. Pp. 450. 12s. 6d.

THE "Medical Annual" is too familiar to need description and too good to need recommendation. It succeeds extraordinarily well in presenting the new things of practical interest and value sorted out from the welter of the year's literature, and it does so with just enough discrimination, just enough detail, and just enough comment and synthesis from its able and experienced contributors, to make it invaluable to any doctor who wishes to be up to date in more than the narrowest of specialties. Five new names appear in this year's list of reviewers: Dr. Ivor Davies succeeds the late Vincent Coates in the section on rheumatic diseases; Dr. L. S. T. Burrell deals with pulmonary tuberculosis; and Mr. K. H. Pridie with orthopædic subjects. Dr. L. P. Lockhart writes a special article on medicine in an industrial state, and Mr. D. Harcourt Kitchin another on medico-legal problems and recent legal decisions. The editors have the impression that the progress of medical knowledge is speeding up; if so, the value of their Annual, which is a credit both to the English profession and to English medical publishing, is increasing.

This year there also appears the decennial general index, which, in addition to indexing all the headings in the last ten annuals, has a short finger-post article by each of the 30 reviewers, surveying his field and pointing to the spots where growth and development have been most active.

Triple Challenge

Or War, Whirligigs and Windmills. A Doctor's Memoirs of the years 1914 to 1929. By HUGH WANSEY BAYLY, M.C. London: Hutchinson and Co., Ltd. 1935. Pp. 396. 18s.

THE sub-title of this book, though not very definite, gives a good idea of the generous hotch-potch ladled out by Mr. Wansey Bayly. He has plenty of material, especially in his account of the war years, to make an intensely interesting book; but like many historians he cannot bear to discard the personal implications of his narrative, so that a sense of proportion is lost. For instance, he may describe how he lost his hat with as much circumstance as he does the Dogger Bank action. Those who can pardon these irrelevancies, however, will find the war chapters full of valuable information, as well as of stimulating writing. The author's patriotism takes a form which many will approve of and many will not—a fact that may rouse a spirit of controversy in the reader and sustain his interest in the political excursions. The closing chapters of the book deal with the attempt made after the war to provide facilities for educating the public in the prevention of venereal disease, and Mr. Bayly writes with inside knowledge of movements in which he took a prominent part, never disguising his own strong views.

The book is embellished with war pictures, one of which is a photograph of the hull of the *Blücher*, crowded with men, within a few moments of her sinking. The episode will give for some a sufficiently appalling answer to an appeal to ready militarism; on others a different impression may be produced.

Furneaux's Human Physiology

Revised by WILLIAM A. M. SMART, M.B., B.Sc. Lond., F.Z.S., Senior Demonstrator of Physiology; Lecturer in Pharmacology and Toxicology, London Hospital Medical College. London: Longmans, Green and Co., Ltd. 1935. Pp. 348. 4s.

FEW books contain so much in a small space as this excellent little manual, which includes a great deal of anatomy as well as physiology. The present edition is completely revised and intended primarily for the use of nurses. An account is given of all the systems of the body, and the exposition is brief, dogmatic, and to the point, all kinds and sizes of print being used for emphasis and the introduction of new words. An attractive feature is the inclusion in parentheses of Greek and Latin roots with their original meanings, and "the consideration of the evolutionary, comparative, and philosophical aspects of the subject." This quotation from the preface is a little ambitious considering the size of the book, but a praiseworthy attempt has been made to make it an introduction to biology as well as a text-book, and culture has not been entirely neglected in the cause of instruction. No secret is made of this as the main object however, and there is a summary at the end of each chapter and examination questions at the end of the book. As the book is designed for nurses (a special edition for schools exists, without the chapter on reproduction), it might perhaps have dealt a little more fully with the principles of dietetics and temperature control, though the author would be entitled to retort that to extend its scope further might be injudicious. Controversial points are, of course, treated rather cavalierly, and the purist might quarrel with one or two statements, but actual mistakes are few. One is the reference to *œstrin* as the active agent in the Aschheim-Zondek test for pregnancy.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 7, 1935

BOTULISM

AFTER an interval of almost exactly thirteen years the public have been startled by the occurrence of another group of deaths due to botulism. Since the Loch Maree tragedy in August, 1922, when eight persons died within a week in the West Highlands of Scotland, there have been no cases in this country officially certified as such, though several times suspicion has arisen. In Scotland there is no such thing as a coroner's inquest, but the Scottish Board of Health instructed two of its medical officers to make an extensive investigation, the results of which were later published in a book[1] which has remained the classical account of the disease. The poisoned food in the Loch Maree case was wild-duck paste in a glass container; the four persons whose death was investigated by the St. Pancras coroner last month (see p. 584) had eaten nut brawn, a vegetarian product made in London, also from a glass container. In neither case was there any indication that the food was abnormal or unfit for consumption, and in both of them the verdict acquitted the manufacturer of any neglect. In closing the inquest on August 23rd the coroner said there was no suggestion that food in bottles was any more dangerous than food in tins. The closing of the inquest, he added, would not mark the end of the attempt to find where the infection came from; three separate investigations are in hand and it will necessarily be some time before they are complete.

Botulism may be described as infection by a specific microbe, the *Bacillus botulinus*, which gains access to a mass of food material, and there, under very definite and special conditions, produces by multiplication and growth its deadly toxin. This toxin is consumed with the food and is responsible for the characteristic symptoms. The mere consumption of the organism itself is not sufficient to cause botulism; the ordinary conditions of the alimentary tract are not those in which it flourishes. The brilliant researches of K. F. MEYER and his colleagues in California established the fact that the *B. botulinus* is widely distributed in the soil. They analysed 1533 soils of various kinds—335 virgin soils, 274 cultivated soils, 142 garden soils, 161 soil and manure, 51 pasture soils, 570 from vegetables and feeds. Virgin soil, that is, soil unconnected with human habitation, domestic animals, or any form of cultivation, yielded the greatest number of positive results, no less than 37 per cent. containing the organism. Some of these were from mountains 12,000 feet high. Garden soils gave 41 positive out of the 142; soil and manure from animal yards, 20 out of 161; pastures, 19 out of 51; and of the 570 samples of soils under the heading of vegetables and feeds 134 were contaminated. The organism is thus most common in pasture, virgin, and vegetable soil; it is least common in cultivated, garden, and manured soil. Soils from many countries have since been examined, including England, Scotland, Denmark, Holland, Switzerland, Hawaii, and China, with similar results. The *B. botulinus* is apparently present in the soil everywhere. The resistance to heat of the spores from various strains of the organism varies considerably, but MEYER gave the maximum resistance to moist heat of the spores obtained from foods concerned in 26 human outbreaks as follows: 4 minutes at 120° C., 10 minutes at 115° C., 33 minutes at 110° C., 100 minutes at 105° C., and 330 minutes at 100° C.

The clinical picture of an acute case of botulism in man is characteristic and very terrible. There is no well-defined incubation stage. The patient may show no symptoms until he suddenly complains of double vision, caused by commencing paralysis of the muscles of the eyeball. Some have abdominal discomfort before this and there may be vomiting. Then follows more or less complete paralysis of the eyelids, producing ptosis. The patient will lift up his eyelids to see. Then the speech becomes blurred and indistinct. The pupils may or may not be dilated. In attempting to walk dizziness is shown by a staggering gait. Pain is absent at this or any other stage, but there is great discomfort and increasing distress. As a rule constipation is obstinate. There is no rise of temperature and no headache. Further paralytic symptoms soon follow. Difficulty of swallowing supervenes along with other signs of throat paralysis. The larynx is affected and speech becomes impossible. The patient, however, remains in full possession of his mental faculties and conscious of his own state and surroundings. He can even communicate freely by writing, though not by speech. Later air-hunger comes on, partly due to accumulation of mucus which cannot be swallowed or expelled, the various respiratory muscles weaken, including the diaphragm, and finally paralysis of the heart sets in, death occurring 36–72 hours after the onset. It will be noted from the symptoms that the toxin attacks mainly those cranial nerves which supply muscles, while those of special senses, such as hearing, seeing, smelling, are not involved. The mortality is very high. MEYER records 249 deaths in 396 cases, a rate of 62·8 per cent. It may be 100 per cent. in some outbreaks.

In spite, however, of the fact that *B. botulinus* is found in soils all over the world, botulism is one of the rarest of diseases in human beings. It is relatively more common in parts of the continent and in America than in this country for reasons well understood and connected with the national food habits of the people. In Germany the majority of the outbreaks have been associated with the eating of foodstuffs, such as sausages, which have not been thoroughly cooked, but only smoked. In America a number of cases have been associated with the canning or preserving at home of fruits and vegetables. Some of these home-preserved foods are consumed raw, as they come from the container—e.g., spinach and asparagus. American authorities are of opinion that the heating of preserved foods to a temperature of 80° C. is sufficient to destroy the toxin, and therefore to prevent botulism. Thus, it is to be noted, although the spores of the bacillus are highly resistant to heat, the deadly toxin is readily destroyed by temperatures commonly used in preparing foods. These and other facts, which have been worked out by bacteriologists and those concerned in canning processes, are now well known and duly provided for. The temperatures used by manufacturers of tinned foods are well above those necessary to destroy the toxin, and designed to kill the spores as well. They are, of course, far above any temperatures reached in domestic methods. The result is that, despite the millions of tins of food manufactured and consumed all over the world, botulism remains a rare condition, and, it is safe to say, will always remain so. Perhaps because of its rarity an outbreak causes concern and alarm out of all proportion to its prevalence.

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[1] Botulism and Food Preservation (the Loch Maree Tragedy). By Gerald Leighton, M.D., F.R.S.E. London: W. Collins Sons and Co. 1923. 10*s.*

THE BIRTH OF MEDICAL DEFENCE

This is the jubilee year of the Medical Defence Union and the annual report issued to its 18,000 members tells the story of its origin. In the year 1883 two Dulwich practitioners, Dr. Edmund Bower and Dr. W. Cooper Keates were prosecuted first for negligence and then for manslaughter in consequence of their treatment of a child. It was a case of diphtheria with increasing obstruction in which the two doctors performed a tracheotomy and the father was asked to remove the obstruction by oral suction, which he did. Unfortunately he contracted diphtheria and to compensate himself against suffering and pecuniary loss he brought an action for negligence against the doctors. This failed and he then brought an action for manslaughter which was dismissed by the magistrate, without calling upon counsel for defence, with the remark that the case was one of persecution not prosecution. But the two doctors were by this time more than £1000 out of pocket, and this was felt by their fellow practitioners to be so unfair that a meeting was called at which Sir William Jenner presided and considerably more than that sum was raised by public appeal. At this meeting a resolution was passed asking the Royal Colleges to press the Home Office to make some arrangement by which the public prosecutor might obtain the assistance of skilled advisers when called on to proceed against medical practitioners. A leading article in our columns at the time complained that the director of criminal prosecutions had "lent the weight and sanction of his great authority to the parading in a court of justice of such matters as the merest tyro in forensic medicine would have grasped and settled in a trice."

At that time the only medical defence association was a small affair which had never ventured to defend a medical practitioner in a court of law. The British Medical Association was therefore pressed by many of its branches to provide individual medical defence for members, but the Association was advised by counsel that its funds could not legally be used for that purpose. Hence it was that on Oct. 23rd, 1885, a Mr. C. F. Rideal and six other laymen registered the Medical Defence Union as a company limited by guarantee under the Companies Act of 1862 with offices at 16, Bedford-row, London. The early years of the union were difficult. It enlisted the support of that forceful but wayward personality, Mr. Lawson Tait, who became president of the union in 1887; but in the same year the union was nearly wrecked by the perfidy of one of its own staff, and its office was transferred to Birmingham, where Dr. Leslie Phillips was one of the joint honorary secretaries, Dr. A. G. Bateman remaining in London as the other. Both were hard workers and many cases in which medical men were threatened with legal proceedings were withdrawn, although it was not actually until 1889 that an action was fought in the courts, when damages were recovered from the Great Western Railway Provident Society for the wrongful dismissal of a surgeon. In the next year the framework of the union was revised with a view to ensure more continuity of method, but there were some among its members who feared the change and set up the London and Counties Medical Protection Society, with Dr. Hugh Woods as one of its secretaries. The question of amalgamation was raised again and again, but nothing came of it, and now that the two societies have worked for so long side by side, with competition acting as a healthy stimulus to progress, it is perhaps no longer needful to regret these early quarrels. In 1893 Lawson Tait was succeeded in the presidential chair by Sir Victor Horsley who found there another outlet for his brilliant powers of organisation. Again in the following year a rift was threatened within the union, for many members resented the council's decision to defend one of their number against his former assistant, who was also a member of the union. The dispute was however settled by the adoption of the principle that the union would not ordinarily defend or support an action between members of the medical profession and that disputes between members of the union involving a breach of contract should be referred to arbitration. That was the last growing pain before the union entered on its maturity, interrupted only by a momentary tremor in 1903 when the British Medical Association reconsidered its decision not to provide individual medical defence for its members, but again turned it down.

The ideals of the Medical Defence Union, as the report indicates, are now happily expressed in its telegraphic address "Damocles" and in its motto "Dextra Dare." The union expects each of its members to pay his subscription as a personal insurance premium to avert the stroke of the sword; but it also expects him to give it with his right hand, or in other words, with the same sympathetic motive of help to his brother practitioners which inspired the medical profession when it came so magnificently to the assistance of Dr. Bower and Dr. Keates. It is in this respect that the work of the union differs fundamentally from that of an ordinary insurance society. In the face of a substantial claim the directorate of an insurance society naturally considers every possible way of avoiding it, the object being to exclude as many claims as possible; the council of the union does its best in every case to bring the applicant within the union's sphere of action, the members of the council putting themselves in the position of the applicant in trouble. To this difference in practice Mr. Oswald Hempson, speaking at a jubilee dinner of the council, ascribed a large part of the union's success; it was this, he said, that had made his work as solicitor to the union, and that of his father before him, seem so well worth doing.

INSULIN IN MALNUTRITION AND INFECTION

The use of insulin apart from diabetes has never found much favour in this country, but elsewhere this remedy—so powerful in its own place—has been declared valuable in a variety of diseases. It was not unreasonable at least to hope that it might rectify some of the metabolic disturbances associated with acute infections, and Schwentker and Noel[1] have in fact recorded excellent results from its administration, with glucose, in hypertoxic diphtheria. Their results were so startling that the work was repeated in this country by Benn and co-workers.[2] But though these reported favourably on the effect of such treatment, they could record no such remarkable successes; and N. D. Begg's recent investigations[3] suggest it is the dextrose, not the insulin, that is helpful in diphtheria. A second suggestion, that insulin should be prescribed for undernourished patients, finds support in the demonstration by Okada and others that insulin increases alimentary secretion; from which it might be expected that assimilation of food would be accelerated. Joslin[4] believes that thin undernourished people whose emaciation is due to poor appetite can be induced by insulin to take more food, and speaks of its use in non-diabetic cases of tuberculosis. Its mode of action, he admits, is not entirely clear. Freyberg,[5] for his part, leans to the view that the rise of weight sometimes obtained is wholly a result of increased ingestion of food, due to insulin causing contractions of the stomach, and even hunger pains. But most patients do not seem to have such gastric contractions and we are left without full explanation of the remarkably good results obtained by Falta and some others who have used insulin for malnutrition in adults.

Freyberg's own investigations now reported lead him to doubt whether insulin is valuable to the undernourished, and he remarks that "the number of satisfactorily controlled investigations of the value of insulin in undernutrition is conspicuously small." His studies are divided into two parts. The first concerns a group of 9 thin patients, 5 of whom were suffering from afebrile pulmonary tuberculosis, while the other 4 were psychoneurotic. Precautions were taken to prevent their knowing that they were receiving insulin and that an increase in appetite or hunger might be expected. The average duration of the experiments was twenty days and the average amount of insulin per patient was roughly 35 units daily. Of the 9 patients studied, 7 showed no increase in appetite, food-consumption, or rate of gain in weight—indeed 5 of them actually lost weight—and only 1 showed a weight increase. In the second part of the investigation an attempt was made to fatten patients and measure separately the effects of (1) a high caloric diet, (2) the diet plus injection of a placebo, and (3) the diet plus insulin. Of 11 patients studied in this way only 3 showed a response that could be attributed to insulin; in one of these, moreover, a high caloric diet was just as effectual, and in another it was found impossible to reproduce the beneficial effect when a second course of insulin was given. In all, therefore, only 2 patients out of 20 showed any improvement attributable to insulin, and it has to be recorded also that in 2 cases a placebo was apparently more effective than insulin in raising weight. Freyberg's data show clearly a close correlation between caloric intake and weight changes, and he believes that only when insulin produces hunger pains can an increased caloric intake be anticipated. Unfortunately one may have hypoglycæmia without hunger pains, and this leaves an opening for serious risk. Joslin refers to another danger when he points out that "individualisation of the dosage should be emphasised especially in cases in which tuberculosis of the adrenals or liver is present."

The last word on this subject has certainly not yet been said, but Freyberg's investigation is justified, if only because it shows what can be achieved in the treatment of undernutrition by suggestion.

St. Bartholomew's Hospital Extension.—A special block for paying patients is to be built at this hospital, probably on the opposite side of Little Britain from the hospital itself. The funds for this block must come from outside sources, not from general funds, and from 90 to 100 beds are to be provided at a cost of something like £140,000. Thirty per cent. of the accommodation will be set aside for patients able to make some, but not full, payment, and this deficit may be made up out of the general fund.

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[1] Schwentker, F. F., and Noel, W. W.: Bull. Johns Hopkins Hosp., 1929, xlv., 259; 1930, xlvi., 359.

[2] Benn, E. C., Hughes, E., and Alstead, S.: The Lancet, 1932, i., 281.

[3] Begg, N. D.: Ibid., 1935, i., 480.

[4] Joslin, E. P.: Jour. Amer. Med. Assoc., August 3rd, 1935, p. 359.

[5] Freyberg, R. H.: Amer. Jour. Med. Sci., July, 1935, p. 27.

ANNOTATIONS

ECONOMIC CATERING

THE Nutrition Committee of the British Medical Association issued its first report in 1933, as a supplement to the *British Medical Journal* of Nov. 25th. The committee had been appointed six months previously, its terms of reference being "to determine the minimum weekly expenditure on foodstuffs which must be incurred by families of varying size if health and working capacity are to be maintained, and to construct specimen diets." Our readers will remember the reasons set out for choosing 3400 calories instead of 3000 calories (Cathcart and Murray) as the standard man-value requirement, and the controversy which followed the difference between the estimates made by the committee on this basis and those made by a committee of the Ministry of Health. The B.M.A. committee obtained food prices from two sources: (1) some very detailed records available from Stockton-on-Tees, where inquiries had been made weekly over a period of two years from 16 grocers and 9 butchers patronised by working-class families; (2) lists supplied by certain medical officers of health of the prices current in their areas during two weeks in the summer of 1933. Using the mean of each of these sets of prices, 16 specimen weekly diets were compiled showing for each item its quantity, its price according to each standard, its content in protein, fat, and carbohydrate, and its caloric value. There remained the need to convince the public that such diets could actually be procured in the market at something like the estimated cost, and when prepared for consumption would give satisfaction to the families concerned. At the time no attempt was made to work out menus or to give advice on the cooking and preparation of meals, although the committee believed such a measure to be practicable and desirable if the housewife was to make full use of the information supplied in the report. They have now, in response to many requests, issued practical instructions which paraphrase their general scheme in terms of foodstuffs to be bought in the market, with detailed menus and recipes.

A pamphlet on family meals and catering which begins with a Sunday dinner of roast beef, Yorkshire pudding, green vegetables and potatoes, followed by rice pudding, disarms at least one common criticism against diets planned to the greatest economical advantage—that they are often composed of ingredients unfamiliar or unpalatable to the British public. The cold beef for Monday's dinner, followed by shepherd's pie on Tuesday, in the first week's menu is indeed so stereotyped in our homes that at first sight it may seem that the housewife will learn little that she does not already know. But the implied assurance from an influential quarter that on the whole she is already making the best of her resources, and the fact that the recipes are for the most part comparable with those already available in simple cookery books will encourage her to examine the differences and to take full advantage of those suggested on economic grounds. The diet chosen for exemplification is No. 16, designed to meet the requirements of a family consisting of a man and wife with three children, aged 6–8, 10–12, and 12–14. The items of this diet, according to the original Nutrition Committee report, represented a total caloric value of 97,863, the daily quantity of calories per man being 3385. The total first-class protein worked out to 1420 grammes and the daily first-class protein per man to 49 grammes. The cost of the food per man per week was *53·6d.* (Stockton mean) and *65·5d.* (B.M.A. mean), and the minimum weekly cost of the family's food *18s. 5¼d. or 22s. 6½d.*, according to which set of food prices was accepted. The items detailed, in the same quantities, are now set out in shopping lists for three consecutive weeks, with menus for midday dinner and high tea or supper for each of the 21 days. The shopping lists include certain items, such as kippers and corned beef, which do not appear in the menus and are presumably used for breakfast, while the fact that more oatmeal is bought each week than is used in the recipes suggests that the modern fear of porridge as a rickets-favouring article of diet is not shared by members of this committee. The fact that only 3 eggs are bought in each of the first two weeks and only 6 in the third week (where 4 fried eggs and onions figure on the menu of an evening meal from which the youngest child is apparently excluded) directs attention to such items as potato omelette and to the custard which presents an appetising suggestion for two of the Saturdays; it emerges that the "omelette" contains no eggs and that the custard is derived from custard powder.

It would be improper to cavil at the fact that throughout this pamphlet there is no mention of the cost of any items except such vegetables or fruits as may be bought in pennyworths—the amount allocated to these being *2s.* each week. We may assume that the shopping list has been tested by actual trial in appropriate districts, and that the price of the ingredients has been found to correspond roughly with the sum allocated to food for this family in the report. Precision in specifying actual prices in named districts would, of course, have been of considerable interest; and the further omission of any hints for the planning of an adequate breakfast has the disadvantage that the housewife is left without guidance to the proportion of her budget to be allowed for this meal. The reason given for not stating prices is that they vary so much from place to place and from time to time. This has always been the contention of those who hold that any attempt to give advice in terms of actual purchases must fail, and the omissions in this beautifully produced pamphlet may serve to confirm their scepticism. On the other hand, the table of quantities of each of the foodstuffs named in recipes and the notes, for the use of teachers of domestic science, of their food values in terms of content of protein, fat, and carbohydrate, and of their caloric value per lb. will be generally appreciated. The pictorial arrangement of each main meal, daintily set out in casseroles or well-matched china on a spotless tablecloth, suggests the comparative leisure of a cookery student rather than that of a harassed housewife; and the attractive plates are in fact coloured reproductions of dishes cooked according to the recipes by students of the National Training College of Domestic Science in London in their second term.

This pamphlet will have a permanent value in providing schools of domestic science for working-class people with standards which are applicable in the homes of the pupils without modification. It can be obtained by such schools at *3s. the dozen* copies, that is, at half the price of the separate copies, on application to the financial secretary of the British Medical Association.

OBSTETRICS IN DUBLIN

THE reputation of Dublin as one of the leading obstetric schools of the world has been maintained not only by the enthusiasm of successive generations of students and practitioners grateful for its practical teaching, but also by the clarity with which the clinical results obtained at the three maternity hospitals are every year correlated and presented. In the London hospitals no doubt the amount of supervised obstetric work is much larger, but most of this work is recorded and laboriously tabulated by the obstetric registrars, to little purpose. The medical reports from the three maternity hospitals of Dublin are presented to the section of obstetrics of the Irish Royal Academy of Medicine where the fruits of their discussion may be even more instructive than the reports on which it turns. Under its new master, Dr. Andrew Davidson, no drastic change has been made at the Rotunda in the methods and principles which have proved of value in the past. The maternal mortality remains at a commendably low level: in 1934 it was only 0·83 per cent. with a morbidity-rate of 4·2 per cent., despite the large number of complicated cases admitted. In the past 15 years this institution has been responsible for the supervision of some 57,000 confinements with 267 deaths, the percentage mortality being 0·46.

This year discussion at the section was concerned chiefly with some aspects of midwifery which are at the moment much in the public eye. Breech presentations, it seems, present no terrors to the Rotunda staff. External cephalic version was performed successfully in 19 cases, 18 infants being born alive. The fœtal mortality was however even less when the breech presentation was uncorrected, for then there were only 2 dead infants out of a total of 62. Such a record reflects the greatest credit upon the conduct of these cases. None of the reports throws much light on uterine inertia, which is by far the most ticklish problem that faces the obstetrician to-day. Dr. Davidson hopes that hormone therapy may provide the solution. Dr. Gibbon FitzGibbon simply asks that each case of this nature should be reported in detail. The treatment of 23 cases of placenta prævia was varied; last year's excellent results were not repeated. The vexed question of disproportion claims most attention in the reports. The master of the Rotunda condemns routine induction of labour by puncture of the membranes in such cases, but he believes it has its place. In the past however labour had certainly been induced unnecessarily; greater knowledge was needed of the conditions under which it should be done. The masters of the Coombe and of the National Maternity Hospital both appeared to concur, but several who took part in the discussion questioned whether induction of premature labour for supposed disproportion was ever justifiable in the primipara. Dr. Davidson thinks that external pelvimetry will often draw attention to cases of contracted pelvis, and that internal pelvimetry, combined with an estimate of the weight of the infant, will help materially to strengthen the judgment regarding the prognosis for delivery. There is much difference in the recourse to Cæsarean section at the three hospitals. It was done 26 times at the Coombe, 2·2 per cent. of all deliveries; 41 times at the Rotunda, 0·6 per cent. The master of the Rotunda would have it resorted to only when the indications are absolutely clear; under the very best possible circumstances the risk is at least three times greater than that of vaginal delivery under the worst possible circumstances—a very pointed warning. Eclampsia was treated upon the lines that have long been advocated in Dublin and the mortality remained at about the level of 10 per cent. At the Coombe the practice continues of allowing delivery without any attempt to save the perineum.

A YEAR'S SURVEY OF CRIME

OFFICIAL figures about crime are generally soothing. If the tables register decreases, we can share in the credit due to a better world. On the other hand if crime is going up, we can still believe that things are not really worse—it is only that our excellent police are more alert in bringing rascals to justice. Part of the soporific effect produced by official statistics may be due to other causes. The annual volume for England and Wales, just published (Cmd. 4977, 3*s.* 6*d.*), gives us the figures for 1933—a receding period in which our interest is diminishing; will the Home Office never manage to catch up this twelve months of arrears? There is something unexhilarating too about the way in which the information is presented. An introduction of 13 pages is all too short and too jejune. The speculative comments which were prefaced to these annual volumes a few years ago have apparently been cut down in the interests of economy. We could better have spared the tedious 40 pages which tabulate all the possible crimes we can commit; the curious can cull this information from the statute-book or from manuals on the criminal law. The very figures themselves refuse to be sensational. Take, for instance, the steadiness of inquest statistics. In 1928 (the first full year after the amending Act of 1926) there was a total of 31,553; in 1933 it was almost unchanged at 31,669. Here, however, one fact of interest can be extracted. The post-mortem examination without inquest, made possible by the 1926 Act, is proving its value. For every six such cases in 1928 there were eight in 1933. There has been no conspicuous rise in non-jury inquests in the same period.

Crime as a whole fell in 1933 below the figures for 1932 which was in some ways a peak year. If the experts rightly relate this improvement in part to the decrease in unemployment, it is yet notable that attempted suicide is still going up. Last year's figure was a record for this offence. In the volume for 1930 we were officially told that in recent years it was not the practice to prosecute for attempted suicide unless special reason existed—e.g., to keep the offender in custody for his own protection. Since 1925 a person charged with this offence can be dealt with summarily instead of being sent for trial. This change may have increased the number of cases brought to the knowledge of the police. We observe that the only other offence where discretionary latitude exists is that of Sunday trading. Over 30,000 persons were found guilty of it in 1933, but a footnote to the table tells us that in most districts it is not the practice to prosecute for Sunday trading: in the exceptional areas, it seems, a few traders cheerfully run the risk of repeated fines. The murder figures are, as usual, steady. Of the 58 persons arrested on this charge in 1933 one committed suicide on arrest and another before trial; one was certified insane before trial; five were found insane on arraignment, and sixteen were found "guilty but insane." We get a hint here of the price we pay for the defects in our system of diagnosing and treating mental disease. If we turn to the figures of criminal lunatics detained on Dec. 31st, 1933, we find that 439 were so detained where the charge was murder; no fewer than 104 of these had then been in institutions like

Broadmoor for 20 years and over. The corresponding figures for attempted murder, felonious or malicious wounding, rape, indecent assault, and other offences make equally lamentable reading.

The criminal statistics of the year as a whole must be correlated with the changes of population. If juvenile delinquency is increasing, it must be remembered that there were more boys and girls between the ages of 10 and 14 to commit offences. Even when this allowance is made, it is sad to find that children and young persons are becoming more ill-behaved. If the year 1933 is compared with the year 1911 and the number of indictable offences is adjusted to the relative totals of population, we find that a figure of 288 (per 100,000) for boys and girls under 16 charged with indictable offences has leapt up to 370 in 1933, whereas the corresponding figure for older persons has dropped from 232 in 1911 to 189 in 1933. In part this increase may be due to the development of juvenile courts and to the growing recognition of the fact that the treatment of the juvenile offender is dominated by regard for his own best interests. The increase in young persons' offences is largely connected with charges of larceny, which may often be trivial enough. There is also an increase in sexual offences committed by young persons from the age of 16 to 21. One happy feature repeats itself in 1933—namely, the comparative good behaviour of the female sex. Whether it be due to natural virtue or to the sheltered life, the proportion of offenders is nearly eight times higher among males than among females.

ECLAMPSIA AS AN ENDOCRINE DISORDER

IN spite of a vast and ever-swelling literature, the cause of eclampsia and the pre-eclamptic toxæmia of pregnancy remains obscure. This is not for lack of speculation. "Theories" of eclampsia and appropriate régimes of treatment are numerous enough, though none can yet hold its own on a basis of direct evidence. In particular, attempts to demonstrate that the disease is an expression of disturbed endocrine balance have multiplied of late years, and attention has been directed naturally to the pituitary. Evidence for and against the idea of an over-secretion of the pressor hormone of the posterior lobe was summarised in these columns just a year ago,[1] when we concluded that the hypothesis must at present be regarded as unproven. More recently attention has been transferred to the anterior lobe of the gland and some observations of G. Van S. Smith and O. W. Smith[2] deserve careful attention. These workers have investigated the distribution of prolan and œstrin in various tissues and fluids during normal and abnormal pregnancy. In normal pregnancy, they say, the prolan content of blood and urine rises during the early months, falls sharply at the fourth month, and thereafter remains fairly constant; whereas in toxæmia the level remains high even when symptoms do not develop until the sixth or seventh month. The œstrin content of the blood and urine, on the other hand, displays a steady rise throughout normal pregnancy, reaching a peak at term, and in cases of toxæmia the rise is often delayed. The next step in the Smiths' investigation was to analyse the placenta for the same hormones. Here also they find that there is an excess of prolan and a paucity of œstrin in cases of toxæmia. And they conclude that it is the placenta rather than the pituitary which produces the extra prolan.

The immediate value of these experiments lies in the fact that they suggest a means of detecting toxæmia before clinical symptoms appear, though it remains to be seen whether such a test will prove a practical proposition. The underlying significance of the observations is another matter, and it is not likely to become apparent until more is known about the nature and functions of the various hormones concerned. So far at least six factors—namely, prolan A, prolan B, œstrin, progestin (corpus luteum principle), oxytocin, and vasopressin—are known to play some part in the sexual cycle and pregnancy. Even if no further principles are discovered an equation involving six factors, none of which is constant, is not easily solved. The present observations will no doubt be tested and extended in due course, but meanwhile they strengthen the suspicion that eclampsia may one day be recognised as an endocrine disorder.

THE CALCUTTA TROPICAL SCHOOL

Lieut.-Colonel R. N. Chopra's report for 1934 of the Calcutta School of Tropical Medicine records the retirement of several European officers who have served the school well. Lieut.-Colonel H. W. Acton has since died after a long illness, and his death excites the keener regret for the reason that his fertile brain was still young and vigorous. He had been director since 1928, rendering services of equal distinction as teacher, administrator, and research worker. He has left as a legacy to the school the one and only department of medical mycology in India. The imperial serologist, Lieut.-Colonel R. B. Lloyd, has also retired and Dr. Ernest Muir has severed an association of fifteen years long during which his unselfish and painstaking work on leprosy has achieved a large measure of success. His latest work on the leprolin tests has shown it to be of importance in prognosis and treatment. The report contains a running record of special investigation in many directions. The epidemic dropsy which has been so fatal in Bengal and Bihar during this century seems to be yielding up its secret, for a gram-positive spore-forming bacillus, isolated from the stools in many cases, has been found to agglutinate in high dilution with the sera of convalescent patients. Similar organisms have been recovered from diseased rice, and it is more than probable that the toxic products are elaborated mainly in the rice or in the presence of rice. In Colonel Chopra's department a further study has been made of carbarsone,[1] an organic arsenical preparation which is non-toxic and renders the stools free from amœbæ in three to four days. A similar drug prepared in India and called amibiarson has given almost as good results in 40 cases,[2] the ratio of probable cures to failures being 5 to 1. The action of atebrin on monkeys infected with malaria has been further studied and some light on the transmission of kala-azar has been thrown by the observation that hamsters infected through the bite of the sandfly may not show evidence of infection for eighteen months or more. There is a wide demand from hospitals in Calcutta for various bacteriophages prepared in the school; the perplexing thing about choleraphage is that one year it may agglutinate most of the strains of vibrio isolated and another year may not. It seems that her the cholera vibrio or bacteriophage must be educated" to act one upon the other, and its true lue awaits the next epidemic season. The report a milestone in the progress of tropical research hich can be obtained gratis from the superintendent the Government Press at Alipore, Bengal.

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[1] THE LANCET, 1934, ii., 490.

[2] Surg., Gyn., and Obst., July, 1935, p. 27; August, 1935, p. 175.

[1] See THE LANCET, 1933, ii., 663.

[2] Chopra, R. N., Sen, B., and Sen, G.: Indian Med. Gaz., June, 1935, p. 324.

THE PROGRESS OF CREMATION

It is now just fifty years since the first public ematorium in this country was opened at Woking, rgely owing to the enthusiasm of Sir Henry Thomp- n who acquired in 1878 the ground on which it ands. There are now 28 crematoria in this country. uring the year 1934 the municipalities of Birken- ad, Newcastle-on-Tyne, Plymouth, and Stockport pened their own crematoria, Blackpool has since ne the same, while Kent has acquired a suitable te of twelve acres at Charing. But progress is ow and the total number of cremations during 1934 as only 8337, an increase of 866 on the previous ear. An important new move has now been made y the Cremation Society which obtained legal thority on July 8th last to conduct the business industrial assurance. In Sweden, Czecho-Slovakia, nd Germany, where cremation is more popular an it yet is here, a scheme of insurance has helped create a cremation-mindedness among the com- munity. Following this example a small weekly ontribution over a period of years will qualify for ssociate membership of the society with the right cremation at death anywhere in Great Britain. he weekly contribution is only 4*d.* for five years the proposer is under 45, and 3*d.* if he is under 18. n associate may insure further against funeral xpenses up to a maximum of £20. The Cremation ociety is also promoting the formation of a National ouncil for the Disposition of the Dead which has ow come into being and is making its first objective he State registration of undertakers which will ave the way to the revision and codification of he law of burial. The Cremation Society would ke to remove the popular impression that cremation s expensive. Life membership of the society costs ve guineas and covers the cost of cremation at eath at any crematorium in Great Britain. The ddress of the society is 23, Nottingham-place, ondon, W.1.

DANGEROUS DRUGS TRAFFIC AT HOME

The annual report of H.M. Government to the eague of Nations for the year 1934 on the traffic in pium and other dangerous drugs deals with the uestion from a national rather than an international oint of view. It is accordingly largely negative in nuch that it has to relate. No opium, coca, or ndian hemp are cultivated in Great Britain or Northern Ireland. There has been nothing new in egislation or administration nor any official publica- ion during the year under review, except that a ranch of the Home Office has been set up to deal with all matters relating to dangerous drugs. It is again reiterated that addiction to narcotics is not prevalent in the United Kingdom, no difficulty has been encountered in applying the Hague and Geneva Conventions, and no important cases of illicit traffic have come to light. The limitation of the internal manufacture of narcotic drugs has been applied in accordance with the Convention of 1931, though some difficulties have been encountered in securing compliance from countries outside the British Empire in regard to requests for the export to their governments of heroin. Five firms only are licensed for the manufacture of medicinal opium in Great Britain, two only for morphine and heroin, both in Scotland, and one for cocaine at Dagenham (Essex). Prepared (or smoking) opium, which is still exported from India and consumed in British colonies in the Far East, is a prohibited possession in this country and its detection punished by heavy fine or imprisonment, while the seized contraband is destroyed. During 1934, 86 persons were proceeded against under the Dangerous Drugs Acts; in the case of 69 convicted 41 were fined, in 13 cases more than £5, and 28 were sentenced to imprisonment, two of them to penal servitude for three years.

Much information may be gleaned from the statistical tables appended to the report. More than 50,000 lb. of raw opium were imported in the year, mostly from Asiatic and European Turkey. The chief import of cocaine was from the Straits Settlements. 28,844 lb. of raw opium were exported, chiefly to the United States. Of morphine, its salts and preparations, 14,317 oz. left this country, chiefly for Canada, Australia, and India; the consignment to China was only 781 oz., or more than 200 oz. less than in 1933. The total exports of heroin were less, 2099 oz. in all, chiefly destined for Australia, Canada, and South Africa. Of cocaine again exports were less than in 1933, Canada, Australia, South Africa, and India being the chief recipients. Of 71,868 oz. of morphine produced in the licensed factories 24,519 oz. were used for conversion into codeine and 12,651 oz. in the preparation of heroin.

CHANGES IN GERMAN CRIMINAL LAW

In Germany criminal law is changing rather rapidly under the Nazi régime with its bent towards racial improvement, and Dr. V. Müller-Hess, who is director of the Berlin Institute for Legal and Social Medicine, has been at pains to set out[1] how these changes are likely to affect medical practitioners. Operations with the patient's consent are legal provided morality is not offended. Abortion is now a criminal offence and anyone advertising or displaying abortifacients to the general public is liable to two years' imprisonment, a provision which does not apply to abortifacient preparations advertised in medical journals. Where a crime is suspected and an operation is considered necessary to verify the facts it may be performed even against the patient's will—e.g., a blood-alcohol test (Widmark) in proof of drunkenness of the driver in a motor accident, curettage in post-abortion or post-partum cases. Where a person is held to be not responsible for a criminal act through insanity or the effects of alcohol or drugs the punishment is mitigated but he is detained in an institution if the public safety demands it. This plea is therefore no longer put forward for the defence as if the prisoner be acquitted it might lead to his detention. As a measure for reducing the number of persons of low moral standard from whom criminals are to a large extent recruited sterilisation is now recommended. Thus a man of 21 years or over can be castrated if his offence shows him to be a dangerous moral criminal; should sexual perversion lead to homicidal risk castration becomes a means of ensuring the public safety. Dr. Müller-Hess and his colleague, Prof. F. Wiethold, admit that to decide whether castration should be done is a difficult and involved problem; many doctors hesitate to give their opinion on this, for like the death sentence it is final. The whole science of sex must, they argue, be brought into consideration as the secretions of ductless glands other than the testes are responsible for the sexual impulse. The excitable and unbridled moral criminal becomes phlegmatic and peaceful after castration—half of those castrated are said to be cured of their criminal inclinations—but the ability for work is diminished. Castration should not be applied to sexual offences committed under the influence of alcohol. Moral offenders, it is believed, stand in great fear of castration, and the new law is acting as a deterrent. The position has been made a little easier for German practitioners by a resolution passed a fortnight ago at the eleventh International Penal and Penitentiary Congress held in Berlin. This resolution called attention to the "favourable preventive-therapeutic results" achieved in cases with a criminal tendency and recommended an amendment of the laws of all countries so as to facilitate castration upon demand or with the consent of the person concerned. This resolution is naturally more binding on the German than on the foreign delegates, who were in a minority, especially as the president of the congress refused a request for voting by nation. Another resolution, which has received less notice in the German press, was passed disapproving the application to the sterilisation of criminals of principles different from those of eugenic sterilisation in general.

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[1] Münch. med. Woch., 1934, lxxxi., 1679 and 1729.

HYPOTHALAMIC FUNCTION

OF late years no part of the brain has attracted more attention than the hypothalamus. While it has long been known that stimulation of this part of the nervous system evokes pupillary dilatation, rise of blood pressure and contraction of the bladder, the more precise delimitation of the centres responsible for such reactions has awaited the evolution of a more delicate method of exploration than those formerly employed. Such a method is provided by the Horsley-Clarke apparatus. This is essentially a rigid frame that is fitted to the animal's head and supplied with graduated bars so arranged that the precise site in the brain of a delicate needle-like electrode can be determined. Using this apparatus on cats under Nembutal anæsthesia, Ranson, Kabat, and Morgan[1] have systematically explored the hypothalamic region. They obtained a pronounced sympathetic response on stimulating

> "the lateral part of the hypothalamus in the region occupied by the medial forebrain bundle even up to the edge of the internal capsule. . . . Posteriorly the reactive field is concentrated in a narrow zone dorsolateral to the mammillary body and across the midline in the supramammillary decussation. From this point the reactive column can be traced back into the mesencephalon. We believe that an important pathway descending from the hypothalamus runs caudalward through this region close to the mammillary body and undergoes a partial crossing in the supramammillary decussation."

Stimulation of this area inhibited intestinal peristalsis, and in no part of the hypothalamus could a converse effect be produced. They could get no evidence of a parasympathetic centre in the hypothalamus, and here they differ from J. Beattie who holds that such a function is exerted by the "supra-optic-posterior pituitary-tuber cinereum complex."

Elsewhere Dr. Ranson[2] reports that he and his collaborators have found in addition that lesions placed so as to interrupt the continuity of the hypothalamico-hypophyseal tracts, which pass from the supra-optic nuclei to the posterior lobe of the pituitary, will produce symptoms of diabetes insipidus. But it is essential that the lesions should be bilateral and symmetrical. Post-mortem investigation showed atrophy in both supra-optic nuclei and posterior lobe in all the 10 cats studied. It is noteworthy that these workers were not able to produce the picture of Fröhlich's syndrome by experimental hypothalamic lesions. A further point of interest is their observation that extensive injury to the region of the mammillary bodies causes catalepsy and somnolence. This work is being repeated on monkeys, and it will be interesting to see if similar results should be obtainable in an animal so much more closely related to man.

FOOD STORAGE

THE report[1] of the Food Investigation Board for 1934 deals chiefly with how to preserve foods brought from long distances. The discovery that beef can be stored for 60 to 70 days in a chilled state by enriching the air of the store with carbon dioxide has made it practicable to bring beef to this country from Australia and New Zealand, and the first shipment has arrived here in good condition. The interests of the home producer are being cared for by a further development of gas storage for the preservation of apples; there is now storage capacity for about 400,000 bushels. The herring industry is being promoted by experiments at the Torry Research Station, which have shown that herrings frozen at the usual temperature of minus 5° F. would still make good kippers after at least five months' storage at that temperature. Home-caught fish may thus be available all the year round. Certain kinds of fruit have been found to keep free from mould for a longer period if wrapped in iodised paper; some varieties however resent this treatment. The use of iodised wrappers is accordingly being tested under commercial conditions. Those who retain the juvenile habit of eating apples, peel and all, may claim a scientific warrant for so doing, as it has been found that in Bramley's seedling the vitamin-C content increases as the skin is approached, and is six times as great in the peel as in the core. The vitamin potency of rosy apples is more than twice that of green ones. Apples, it seems, do not lose vitamin potency either on storage or when canned. Experiments on the addition of artificial vitamin C to foods such as runner beans and other vegetables which do not naturally contain it may lead to the production of useful antiscorbutic foods. The report contains much else of interest. To the work of the Board is largely due the varied selection of foods which we now enjoy at all times of year.

THE King has appointed Mr. James Learmonth, regius professor of surgery in the University of Aberdeen, to be one of the honorary surgeons to His Majesty in Scotland, in succession to Sir John Marnoch, who has been appointed an extra surgeon to His Majesty in Scotland.

Dr. M. Abdy Collins, medical superintendent of the Kent County Mental Hospital, Chartham, has been elected president of the Royal Medico-Psychological Association, in succession to Dr. Reginald Worth. He takes office next July when the Association holds its annual meeting at Folkestone.

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[1] Arch. Neurol. and Psychiat., 1935, xxxiii., 467.

[2] Weir Mitchell oration, Trans. Coll. Phys., *Philadelphia*, 1934 (4th ser.), ii., 222.

[1] *H.M. Stationery Office.* 4s.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXVII.—PROGNOSIS OF MALOCCLUSION OF THE TEETH

MALOCCLUSION of the teeth includes a wide variety of conditions differing greatly in their type, their effect on facial appearance, and their causation. Our knowledge of the ætiology of many forms of malocclusion is still conjectural, so that a correct prognosis is often difficult to make. The following factors, among others, must be considered by the dental surgeon undertaking the treatment of malocclusion of the teeth.

(*a*) If the child is seen at an early age, is the malocclusion likely to decrease with the eruption of the permanent teeth or will it become accentuated ?

(*b*) If the malocclusion is associated with habits such as thumb-sucking or some pathological condition like post-nasal obstruction, does the success of the dental treatment depend on the removal of the associated condition ?

(*c*) Where alternative methods of treatment appear possible, can a forecast be made of the results of either ? For practical purposes this involves a decision between retaining all the teeth and making room by expanding the jaws or providing space by extraction of one or more permanent teeth. A sound judgment is here of fundamental importance, for a method of treatment once embarked upon cannot easily be abandoned if the results prove unsatisfactory. If all the teeth are retained and room made by expansion, a subsequent relapse may be irremediable. If teeth are extracted as a means of making space, this method of treatment is equally irrevocable. Furthermore, the treatment may involve several stages differing in their objects, each of which is contingent on the success of the preceding stage. It is desirable, therefore, to be able to forecast the result of each stage as an essential link in the chain of treatment.

(*d*) If the teeth have been brought into satisfactory alignment, will the corrected occlusion remain stable, or is there any risk of relapse ?

Natural History of Malocclusion

In order to be able to answer these questions, even with reserve, it is essential to be familiar with what may be called the natural history of malocclusion : the onset of the various types and the changes in form or degree which may occur during the growth of the jaws and teeth. Generalised forms of malocclusion affecting many teeth and involving an abnormal relationship of the dental arches to each other, are dependent on abnormal bone growth. Modern investigations have shown that the factors responsible occur in early life and that they express themselves in the form of an abnormal dentition correspondingly early. Minor forms of malocclusion affecting a few teeth may be due to purely local factors such as the persistence of some habit ; the presence of supernumerary teeth ; injury of disease of a deciduous tooth affecting its permanent successor, and so forth. But these forms of malocclusion are of lesser importance, and the fact that their cause is obvious makes the prognosis comparatively easy. Limiting consideration to serious types of malocclusion affecting the jaws as a whole, we can divide their progress into five stages.

4–6 *years*.—At about the age of four to five the spacing of the deciduous incisors normally takes place. This is due to bone growth, and it allows room for the eruption of the larger permanent incisors. If this spacing does not occur, although the milk teeth may be evenly aligned, there will be insufficient room for the permanent incisors, and thus a potential irregularity exists. Some bone growth may occur later but more frequently a progressive crowding of the permanent teeth takes place during their eruption. If the milk teeth themselves are crowded, even if the crowding be slight, then a marked degree of irregularity of the successional teeth may confidently be predicted. Malocclusion involving an abnormal arch relationship, such as protrusion or retrusion of the upper or lower jaw, may be present in the deciduous dentition. Such a condition will undoubtedly be perpetuated in the permanent dentition in an aggravated form. Here we have the answer to the first question. Malocclusion, whether actual or potential, in the deciduous dentition if left untreated will not as a rule improve but rather progress with the eruption of the permanent teeth. The condition of open bite (an elliptical gap between the upper and lower incisors) is not uncommon in the deciduous dentition, and is often, though not invariably, associated with thumb-sucking or the use of a dummy comforter. In the permanent dentition this gap tends to disappear, but the associated protrusion of the upper incisors will probably be perpetuated. It cannot be said that the correction of thumb-sucking or mouth-breathing will in itself effect a cure of the associated irregularity of the teeth, but it will remove one of the adverse factors and thus improve the prognosis.

6–9 *years*.—During the eruption of the permanent incisors which takes place between the sixth and ninth years, these teeth must take the place formerly occupied by the smaller milk teeth. If spacing has not occurred a malocclusion faintly foreshadowed in the temporary dentition will become a definite irregularity.

11–12 *years*.—The degree and character of malocclusion affecting the permanent incisors may undergo a change for the worse during the period of eruptive activity of the canines, which normally occurs between the ages of 11 and 12 years. It is probable that the first premolars will be present Thus the canines must erupt into a gap between the incisors and first premolars. If the arch is narrow or there is crowding of the incisors there will not be enough room for the canines. These teeth may be forced outwards to resemble miniature tusks ; alternatively, their development and movement in the bone prior to eruption may cause them to press on the lateral incisors and tilt these teeth outwards.

12–13 *years*.—The active development of the second or twelve-year-old molars exerts a pressure on the end of the arch which may push forward the anterior teeth. Any degree of crowding present may thus be made worse. Sometimes a slight degree of crowding not previously severe enough to warrant treatment may be turned into a positive irregularity by the eruptive force of the second molars. If treatment has been carried out with apparently satisfactory results by means of an expansion appliance, relapse may occur at this stage. If, on the other hand, treatment has not been instituted on the grounds that the previous condition did not warrant intervention, then the most favourable period for commencing treatment has been passed and the chances of producing a satisfactory result will be correspondingly lessened. In deciding how long retention of a corrected occlusion should be maintained, attention must be paid to this factor, and any appliance used for retaining the teeth in place should always be worn until the second molars are well in position.

From 17 *years onwards*.—The time of eruption of the third molars or wisdom teeth is very variable. But from about 17 years they are in active growth and their eruption may occur at any period after this age. It is only recently that the third molars have been recognised as factors in orthodontics. In the past many treated cases have relapsed because of the pressure of the wisdom teeth. Before giving a prognosis on the probable progress of malocclusion or on the permanence of the effect to be anticipated from treatment, radiograms should always be taken to ascertain the presence and position of the wisdom teeth. In estimating the amount of room required to accommodate irregular incisors and canines, the dental surgeon must always remember the increasing pressure from behind, consequent on the development and eruption of both the second and third molars, as a factor of fundamental importance which affects the choice of treatment and the ultimate stability of the results obtainable. Similarly, a slight degree of crowding in a child of ten or twelve with its dentition complete for that age—i.e., with the permanent canines and second molars present—may become a marked irregularity a few years later when the third molars begin to approach their eruptive stage. Failure to recognise this possibility at an age when treatment is possible means that when the malocclusion becomes actual and obvious the child has passed the age when treatment is likely to be effective. On all grounds, therefore, it is of cardinal importance to ascertain the position of the third molars and to take this factor into account in making a prognosis both of the development of malocclusion and the results of orthodontic treatment

Results of Treatment

There are many different forms of malocclusion, but speaking broadly the choice of method resolves itself on a decision to move the misplaced teeth by various types of appliances or else to make room by the extraction of one or more permanent teeth. The problems of prognosis of the results of treatment may conveniently be illustrated by taking three characteristic forms of malocclusion.

1. *Superior protrusion,* where the deformity affects mainly the upper arch, and shows itself by a narrow arch, high palate, and prominent front teeth.
2. *Inferior retrusion,* in which the lower jaw is under-developed, the chin is receding, and there is an associated prominence of the upper incisors.
3. *Inferior protrusion,* in which the lower jaw is over-developed and the upper front teeth lie inside the lower incisors instead of overlapping them.

SUPERIOR PROTRUSION

Here the jaw is narrow; the front teeth slope forwards and the lower lip tends to lie behind them, thus making their prominence worse. The essential element in treatment is to push back the upper incisors and canines. In order to create the necessary space the upper arch must either be expanded by an appliance or else a pair of teeth, usually the first premolars, must be extracted. Both methods have their advocates, but it must be borne in mind that the real crowding in these cases is in the region of the roots of the teeth. Expansion is not really a bodily movement of the teeth, but rather a tilting of the crowns, with a relatively slight degree of movement in the all-important apical region. It is not difficult to push out the crowns by means of an appliance and to obtain what looks like a satisfactory result. But since the treatment rarely stimulates bone growth there is a risk that the teeth, though evenly aligned, may look a size too large for the face. Furthermore, the pressure from behind of the second and third molars, already referred to, may cause relapse in later life. There is a place for the treatment of these cases by expansion, but in my opinion it should be the method of choice only where the amount of room required is small, say 3 to 5 mm. If the space required is greater than this, then extraction of a pair of permanent teeth may give a better and more stable result. The removal of the first premolars allows the canines to fall back into place, and thus permits the retraction of the prominent incisors to be carried out easily. An additional benefit is that a gap is thus created in the chain of pressure from behind due to the development and eruption of the second and third molars, and one of the most potent causes of relapse is obviated. It is often wise to commence by expansion at about the age of 7 or 8, to see how the jaw develops and later on to extract the premolars when the canines are approaching eruption.

INFERIOR RETRUSION

In this condition, which appears to be getting more common, the defect is primarily in the mandible, which is under-developed. The method of choice is to try to bring the lower jaw forwards by means of a plate in the upper jaw, the front of which forms an inclined plane so that when the child bites the lower incisors impinge on the plane and the mandible is thrust forwards. The molars probably erupt more and come into a fresh occlusal relationship, thus stabilising the bite in the new position so that the forward position of the lower jaw, which is thus induced, becomes anatomically fixed. Another method which finds favour with many dentists is intermaxillary traction. This consists of arches fixed to the upper and lower jaws by bands cemented to the molars so that it cannot be removed by the patient. Elastic rings are fixed to the arches so that when the mouth is opened the tension of the elastics tends to pull the upper teeth back and the lower teeth forwards. Prognosis should be guarded. The treatment, though often effective, is to some extent empirical, and in a certain proportion of cases the lower jaw fails to come forwards and though the appearance of the chin is improved so long as the appliance is worn, when it is left out the condition relapses. If treatment is commenced at 8 years, and by the age of 11 years the lower jaw has failed to move forwards, it is improbable that the retrusion of the mandible will be corrected. This does not mean, however, that orthodontic treatment has failed completely. The associated protrusion of the upper incisors, which always exists in this condition, can be treated on the lines already described. There will be a material improvement even though the mandibular retrusion still remains. But while extraction of a pair of maxillary teeth is often an integral part of the treatment, extraction of lower teeth should never be done. Since the lower jaw is developmentally too small it would be a grave error to make it still smaller by the extraction of permanent teeth.

INFERIOR PROTRUSION

This condition is relatively rare. It is often inherited. It is, perhaps, the most difficult of all forms of malocclusion to treat; but in its severe forms it is so marked a deformity that an attempt should always be made to treat it, especially in a girl. The earlier the treatment is commenced the better is the prognosis. While the defect is primarily in the mandible it is not possible to diminish the size of the jaw except by surgical measures, which involve a serious operation. The surgical correction of inferior protrusion has been practised in America by Kazanjian, and in France by Dufourmentel, with satisfactory results. The possibility of utilising this method might be considered in exceptionally severe cases, but it can scarcely be regarded as a normal part of orthodontic treatment at the present time. The essential part of treatment is to push out the upper incisor teeth so that they lie outside the lower incisors, as in the normal jaw. Once this is done the lower incisors will retain the upper ones in place, while the latter will limit the possibility of the lower incisors moving still more forwards and thus increasing the malocclusion. A reduction in size of the lower arch should then be attempted by extraction of an incisor or a pair of premolars combined with the use of an appliance to retract the lower front teeth. The best time to commence treatment is when the upper incisors begin to erupt, for a slight degree of force will then suffice to guide them into a normal alignment. The prognosis is reasonably good both as regards the actual treatment and the liability to relapse and it is usually possible to obtain an improvement, though a restoration to an anatomically normal relationship of the arches is unlikely. In some cases, however, the unknown factor which has led to an over-development of the mandible seems to be progressive, and despite all treatment the condition persists and gets worse. For this reason the prognosis should be cautious.

Orthodontic Appliances

Orthodontic appliances may be divided broadly into *fixed* and *removable* ones. The former cannot be removed by the patient and depend for their retention on bands cemented to various teeth. The latter are like dentures which can be removed at will and are held in place by bands or wires round teeth. Their efficiency depends on a good anchorage and effective leverage. Practically all movements of misplaced teeth can be effected by either fixed or removable appliances provided they are properly constructed. In some cases a fixed appliance is better as affording a more effective application of force to the teeth to be moved. In others, a removable appliance may be preferable; in many cases it may matter little which type is employed. Fixed appliances call for a higher degree of technical skill in their construction and are often more expensive. They are sometimes criticised on the grounds that their presence interferes with the hygiene of the mouth. But if they are properly made, and a reasonable degree of coöperation on the part of the patient can be assured, it is doubtful if a fixed appliance is inherently less cleanly than a removable one.

In complicated cases of malocclusion where movements of individual teeth are required, a fixed appliance, which gives a firm anchorage and allows of an accurate apposition of force to the teeth to be moved, is often better than a plate which is less secure and more liable to move. But fixed appliances are delicate and easily broken, while their repair may be difficult. Since it often happens that children undergoing treatment spend a large part of their life at boarding-schools, the dentist may find it wise to use the simpler method of a removable plate as less likely to be broken, though possibly less mechanically effective. The choice of appliance must always be left to the dental surgeon in charge of the case, for he alone can decide on the method of treatment and adopt the apparatus most likely to bring about the desired result. Provided that the dental surgeon possesses the experience and skill to justify him in undertaking orthodontic treatment, the prognosis should not be materially affected by the particular type of appliance he employs.

Prognosis in Treated Cases

Orthodontic treatment is likely to be tedious; moreover, it involves a considerable interference with a child's life, may clash seriously with its education, and is often costly. Treatment is usually sought because of the ugly appearance of irregular teeth; in a girl the æsthetic defect may attract little attention until adolescence. Then it may be a serious blemish, though at that age little can be hoped from treatment. Early diagnosis is essential and involves recognition of the ultimate progress of the condition if left untreated. The ideal age to commence treatment is about eight, when the permanent dentition is making its appearance and the child is old enough to give the necessary coöperation. The parent has a right to know and the dental surgeon will be expected to say whether there is a good prospect that treatment apparently successful at the age of 12 will remain so in later life. It is not always easy to prophesy, and even the most experienced practitioner may find cases which relapse unaccountably. But the dental surgeon who selects carefully his method of treatment, with due regard to what the various appliances can accomplish and remembers that it is the position of the roots in the bone which matters rather than the crowns of the teeth, should be able to make a reasonably sound prognosis. If he visualises the changes likely to occur during the phases of growth and plans his treatment with the idea that room must be made not merely for those teeth which are irregular, but also for the entire dentition, he will not run the risk of finding a "good" result relapsing through subsequent growth changes. Much orthodontic treatment has failed in the past, and doubtless will continue to fail, because operators have not realised that while it is comparatively easy to move teeth with the delicate but powerful appliances now available, relapse is almost inevitable if there still remains a condition of crowding in that part of the jaws which contains the roots of the teeth.

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PEPTIC ULCER OF MECKEL'S DIVERTICULUM

THIS rare cause of severe intestinal hæmorrhage is discussed in a paper by Crols and Van Hasselt in the *Nederlandsch tijdschrift voor geneeskunde* (1935, lxxix., 3637).

Their own patient was a boy aged 3½, and the history was that four days previously he had complained of abdominal pain, which passed off after the bowels had moved. The next day there was another similar attack of pain, followed on this occasion by the passage of a large quantity of dark red blood, and later of a further quantity of tarry blood. On admission to hospital the child was very pale, with a small and rapid pulse. Nothing abnormal was found on abdominal examination except a slightly tender spot to the right of the umbilicus. The rectum was full of blood clot; no polyp or intussusception could be felt. As profuse bleeding continued, immediate operation was performed, and a Meckel's diverticulum, distended with blood, was removed. It was found, on microscopical examination, that the mucous membrane lining the distal part of the diverticulum was of a similar type to that of the fundus of the stomach, including many oxyntic cells. The ulcer from which the bleeding had come was situated in the basal part of the diverticulum—i.e., in the part lined with mucosa of intestinal type. It measured about 4 mm. across, and an open vessel could be seen in the base, which was formed by fibrous tissue infiltrated with round cells, the muscularis having completely disappeared. The patient made a good recovery.

The authors point out that a number of similar cases of ectopic fundus epithelium in Meckel's diverticulum have now been described; they compare the occurrence of a peptic ulcer here to that of a gastrojejunal ulcer after gastro-enterostomy. Cases of hæmorrhage from, or perforation of, the ulcer have been reported, mostly in young children, and almost always in males. The differential diagnosis must be made from intussusception, rectal polyp, and blood diseases such as purpura and the like; in cases with perforation, from acute appendicitis. If, as sometimes happens, perforation is preceded by hæmorrhage, this should suggest the possibility of an ulcer of Meckel's diverticulum. Intussusception is ordinarily seen at an earlier age than the much rarer peptic ulcer of the diverticulum.

SPECIAL ARTICLES

WEIL'S DISEASE AMONG COAL-MINERS

IN NORTHUMBERLAND AND DURHAM

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LEPTOSPIRAL infection is probably commoner in the British Isles than might be supposed from the number of cases on record. Since Manson-Bahr's[1] case in 1922 there have been only three satisfactory accounts of outbreaks in this country. Buchanan[2] in 1927 described 31 cases in the Edinburgh area of which 17 were miners. The mortality in his series was 25 per cent. He found virulent leptospiræ in the slime and water in coal-mines and he was able to demonstrate leptospiral infection in about 37 per cent. of wild rats. Hamilton Fairley[3] in 1934 described 2 fatal cases of Weil's disease in London sewer-workers and obtained positive agglutination reactions from 8 other sewer-workers who had suffered from jaundice from seven months to twelve and a half years previously. Davidson[4] and others in 1934 reported a series of 19 cases from Aberdeen, 12 of the patients being fish-workers; the mortality was 31·6 per cent. Halsted[5] described another case in a London sewer-worker and Wolstencroft[6] an isolated case in a canal-worker. Alston and Brown have recently attempted to determine the degree of exposure to risk of sewer-workers and to explore the possibility of prevention by vaccination and other methods.[13]

The best recent account of Weil's disease is that of Schüffner[7] who describes 452 cases from Holland. Most of them occurred in bargemen, fishermen, and slaughterhouse workers; others followed immersion in canals. The mortality in this series was only 10·2 per cent. This low figure is accounted for by the large number of proved cases (60 per cent.) which showed no jaundice and none of which died. The mortality among jaundiced cases was roughly 25 per cent., a figure which is directly comparable with those of the British workers who dealt only with jaundiced cases.

It is generally agreed that leptospiral infection in man is a result of contact with fresh water which has become contaminated by the excreta of infected rats. The portal of entry of the leptospira is probably through small abrasions, and Schüffner[7] from experiments with guinea-pigs showed that the organism has difficulty in penetrating the intact epidermis. He also mentions an epidemic in Lisbon which was spread by drinking water. Man-to-man infection is so rare as to be negligible. Estimates of the carrier-rate for leptospiræ in rats vary. Coles[8] found infection in 9 per cent. of rats from Bournemouth, Foulerton[9] obtained 4 positive results from 101 London rats, while Stevenson[10] also working with London rats found leptospiræ in 30 per cent. Cookson[11] has found leptospiræ in one rat from a Northern colliery in which cases of jaundice had occurred.

The heavy mortality of the more severe form of Weil's disease makes it necessary that more attention should be paid to preventive measures directed against rats and moisture in places where there is danger of incurring infection.

The Present Series

During the last two years we have observed 12 cases of severe jaundice occurring in miners in Northumberland and Durham, in 9 of which we have been able to establish the diagnosis of Weil's disease either by guinea-pig inoculation of blood and urine or by the agglutination reaction which Schüffner[7] considers to be proof positive. Four patients died, giving a mortality of 33 per cent. We have not seen in hospital any cases of Weil's disease without jaundice, but we think it not unreasonable to assume in view of Schüffner's 60 per cent. of unjaundiced cases that many mild attacks of the disease must have escaped notice.

CLINICAL FEATURES

Incubation period.—Schüffner[7] found an average incubation period of 10·3 days. As all our patients were working up to the day of onset and with one exception gave a history of working daily in wet seams it was impossible to determine the date of infection.

Mode of onset.—Lassitude and malaise were present at the onset in all cases. Vomiting occurred in 9 and headache in 7 cases. Abdominal pain was present in 5 and pains in the joints and back in 4. Two patients complained of shivering, 4 were constipated, and 2 had diarrhœa. One patient became deaf and complained of dimness of vision. In one case (No. X.) anuria preceded the appearance of jaundice.

Jaundice appeared 2–9 days after the onset, the average interval being 5 days.

Hæmorrhages.—Except in two cases there was some form of bleeding. (See Table.)

Fever was very variable. Six cases were apyrexial throughout and four of these were fatal. Primary and secondary fever occurred in two cases and in each case the secondary fever was accompanied by rigors. One other case which had no fever on admission exhibited a typical secondary rise while in hospital. Three other cases showed primary fever only. The highest temperature recorded was 103° F.

Renal findings.—A striking feature of three of our cases (Nos. X.–XII.) was a very high blood-urea. Case X. had suppression of urine for 36 hours and in Case XI. there was said to have been some diminution of urinary output before admission. No history of anuria was obtained in Case XII., but the patient passed only 10 oz. of urine in the twenty-four hours between admission and death. In no other case was any diminution of urinary output noted. Albuminuria was present in 10 cases but was heavy in only 6. It is worthy of note that in Cases XI. and XII., which showed very high blood-urea figures, only a trace of albumin was found. For further details the reader is referred to the individual case reports.

Uræmia in Weil's disease has long been recognised on the Continent. Georgopoulos[12] in 1933 reviewed the prevailing opinions on the subject. He quotes the French writers as laying great stress on increased urea-production, but considers that there must be considerable impairment of renal function in addition in spite of the well-known fact that the renal lesions

Case.	Colliery.	Jaundice. B. = Units bilirubin. P. = Phosphatase units.	Hæmorrhages. Occ. bl. = Occult blood in fæces.	Nephritis. B.U. = Blood-urea in mg. per 100 c.cm.	Bacteriological findings. g.p. = guinea-pig.			Result.
					Blood.	Urine.	Agglutination.	
I. ..	A.	50 B. 9·4 P.	Epistaxis. Occ. bl. +.	No albumin.	—	No lep. found.	Pos. up to 1/300.	Relapse. Recovery.
II. ..	A.	52 B. 5·5 P.	None.	Albumin +.	Neg. g.p.	No lep. found. Neg. g.p.	,,	,,
III. ..	A.	22·5 B. 8·7 P.	Petechiæ.	Albumin trace.	—	Pos. g.p.	—	Recovery.
IV. ..	A.	16 B.	? Hæmatemesis.	No albumin.	Neg. g.p.	Neg. g.p.	Pos. up to 1/300.	,,
V. ..	A.	+	Petechiæ. Occ. bl. +.	Albumin +.	—	—	—	Died.
VI. ..	C.	115 B. 8 P.	Petechiæ. Hæm'ic herpes. Occ. bl. +.	,,	Neg. g.p.	No. lep. found.	—	,,
VII. ..	A.	40 B. 8·2 P.	Hæm'ic herpes. Occ. bl. +.	,,	,,	Neg. g.p.	Pos. up to 1/1000.	Recovery.
VIII. ..	B.	+	Petechiæ. Epistaxis. Occ. bl. +.	,,	Pos. g.p.	Pos. g.p.	—	,,
IX. ..	B.	+	Epistaxis. Occ. bl. +.	Albumin trace. B.U. 85.	Neg. g.p.	Pos. g.p.*	Pos. up to 1/1000.	Relapse. Recovery.
X. ..	D.	18 B. 10·6 P.	Epistaxis. Occ. bl. +.	Anuria. Albumin + + +. B.U. 285.	,,	Neg. g.p.	Pos. up to 1/3000.	Recovery.
XI. ..	A.	40 B.	Epistaxis. Petechiæ. Hæmatemesis.	Albumin trace. B.U. 387–600.	Pos. g.p.	Lep. present. Neg. g.p.	—	Died.
XII. ..	E.	46 B.	Petechiæ.	Albumin trace. B.U. 567.	Neg. g.p.	—	—	,,

Lep. = leptospiræ. * g.p. died with jaundice but no leptospiræ found.

in Weil's disease are often comparatively trivial and mainly consist of degenerative changes in the collecting tubules. This view seems to us to be reasonable and is supported in our Cases X. and XII. by definite impairment of water-excretion. In Case XI. at a time when the blood-urea stood at 630 mg. per 100 c.cm. the concentration of urea in the urine was 1·64 per cent.

In no case was there any œdema or rise of blood pressure.

Cerebro-spinal fluid.—In two cases (Nos. IV. and XI.) lumbar puncture was performed and the cerebro-spinal fluid showed, in addition to bile staining, a slight increase in protein and a considerable lymphocytosis. No leptospiræ were found. We have found no record of changes in the cerebro-spinal fluid in the literature of Weil's disease.

CASE RECORDS

I

Colliery A. A. B., aged 27. Admitted July 7th, 1933; discharged August 5th. Eight days before admission he complained of chill, headache, and lassitude. Jaundice appeared on the seventh day and was accompanied by dimness of vision and slight deafness. Also complained of epigastric pain and vomited twice. Worked in damp rat-infested seam.

Admission state.—Temp., 97·9° F.; pulse-rate, 72; intensely jaundiced and drowsy; papular non-hæmorrhagic rash generally; tenderness and rigidity below right control margin; spleen not palpable; blood pressure, 128/78. Urine: specific growth, 1010; acid; bile +; no albumin. Wassermann reaction negative. Van den Bergh reaction: 50 units; direct. Phosphatase: 9·4 units. Fæces: occult blood present.

Progress.—On July 9th there was severe epistaxis. The temperature remained normal until the 17th when there was a secondary rise which lasted until the 25th. Thereafter convalescence was uneventful. Urinary output 70–80 oz. daily.

Bacteriological findings.—No leptospiræ found in urine. Agglutination for *Leptospira icterohæmorrhagiæ* positive up to 1/300 two years after illness.

II

Colliery A. C. D., aged 34. Admitted Nov. 25th, 1933 discharged Jan. 16th, 1934. Three days before admission developed pain in the back and joints, shivering and vomiting. Fellow-worker of A. B. (Case I.).

Admission state.—Temp., 101·6°; pulse, 88; no jaundice on admission, but this appeared on the following day and rapidly deepened to an intense orange yellow; abdomen tender below right costal margin; liver palpable for 1½ in.; no splenomegaly. Urine: sp. g., 1018; acid; bile, +; albumin, +; granular casts. Van den Bergh reaction: 52 units; direct. Phosphatase: 5·5 units.

Progress.—The temperature swung for nine days and then remained normal until Dec. 8th when it was 99°. Next day there was a rigor with severe pain over the liver. The liver was palpable for 2 in. and tender and the temperature was 100·5°. The secondary fever lasted ten days and thereafter convalescence was uneventful. The urine output was from 40–70 oz. daily.

Bacteriological findings.—No leptospiræ in urine. Urine obtained on the nineteenth day of illness failed to produce the disease in two guinea-pigs. Agglutination for *L. icterohæmorrhagiæ* positive up to 1/300 19 months after illness.

III

Colliery A. E. F., aged 26. Admitted Dec. 29th, 1933; discharged Jan. 20th, 1934. Illness began 14 days before admission with weakness, abdominal pain, and vomiting. He had been "working wet" in the pit. In three days jaundice was noticeable. A generalised erythema developed which lasted for 4 or 5 days. No bleeding.

On admission.—Temp., 97·5°; pulse, 110; general condition good; bright golden jaundice; nothing abnormal detected in heart, lungs, or abdomen; blotchy petechial rash over the trunk. Urine: sp. g., 1020; neutral; trace of albumin; bile, ++; no leptospiræ found. Fæces: clay-coloured; occult blood test negative. Van den Bergh reaction: total bilirubin, 22·5 units; direct reaction. Phosphatase: 8·7 units.

Course.—The patient was never seriously ill and there was no fever after admission. Recovery was uneventful.

Bacteriological findings.—Two guinea-pigs were inoculated intraperitoneally with 1 c.cm. of centrifuged urine obtained on Jan. 3rd (nineteenth day of illness). One died on Jan. 15th and the other was ill and was killed. Both showed jaundice, slight hæmorrhages and mottled lungs. Only a few dead leptospiræ were seen on dark-ground examination of material from the liver. A further sample of urine was obtained on Jan. 10th and a guinea-pig inoculated. It became ill and was killed on Jan. 24th. It showed jaundice, hæmorrhages in the intestine, and mottled lungs. Typical active *L. icterohæmorrhagiæ* were present in the liver on dark-ground illumination.

IV

Colliery A. G. H., aged 36. Admitted March 1st, 1934; discharged March 17th. Illness began six days before admission with pain in the neck, which he attributed to water dripping on him in the pit. Jaundice was noted on the following day. There was abdominal discomfort and he vomited several times. There was said to have been blood in the vomitus on one occasion. The bowels became constipated.

Admission state.—Not acutely ill; temp., 98°; pulse, 84; slight jaundice; no rash; nothing abnormal in lungs or heart; slight upper abdominal rigidity. Urine: sp. g., 1020; acid; no albumin; bile, +. Van den Bergh reaction: direct reaction positive; 16 units bilirubin. Cerebro-spinal fluid; bile-stained; total cell count, 136 per c.mm.; lymphocytes, 93 per cent.; polymorphs, 7 per cent.; protein, 0·12 per cent. Wassermann reaction positive.

Course.—There was slight pyrexia up to 101° for the first three days, after which the temperature fell to normal. Recovery was uneventful.

Bacteriological findings.—Blood, urine, and cerebro-spinal fluid all failed to produce illness in guinea-pigs. Agglutination of *L. icterohæmorrhagiæ*. Positive up to 1/300 16 months after illness.

V

Colliery A. J. K., aged 38. Admitted Oct. 27th, 1934; died Oct. 28th. Seven days before admission he complained of faintness and severe headache. Four days later he became jaundiced and vomited blood-stained material. Appetite lost and bowels constipated.

Admission state.—Temp., 97°; pulse, 104; very ill; intense jaundice and generalised petechial hæmorrhages; tongue dry and furred; abdomen tender and liver palpable for three inches. Urine: sp. g., 1015; acid; albumin and bile present. Fæces: occult blood present. Death occurred on the day after admission.

Post-mortem findings (Dr. J. G. Thomson).—Hæmorrhages and necrosis of upper third of rectus abdominis muscle. Lungs: very marked pulmonary œdema and small subpleural hæmorrhages; blood in trachea. Heart: petechiæ in pericardium and endocardium; stomach contained blood-stained fluid and showed four acute ulcers near the pylorus; small acute ulcer in the œsophagus 1½ in. from the cardia; numerous petechiæ and erosions in stomach. Liver: slightly enlarged; no striking lesions present. Kidneys: slightly enlarged; cortex swollen and pale and showed tiny petechial hæmorrhages; mucosa of pelves extremely hæmorrhagic. Intestines: a few petechial hæmorrhages.

Microscopical findings.—Kidney: much hyperæmia; intense cloudy swelling of tubules with debris in their lumen; glomeruli normal but proliferation of Bowman's capsule and debris in the capsular spaces. Liver: very marked cloudy swelling of the parenchyma cells generally with poor nuclear staining but no actual necrosis; the normal lobular structure had disappeared. No leptospiræ were found in Levaditi preparations of liver and kidney.

VI

Colliery C. L. M., aged 52. Admitted Oct. 30th, 1934; died Nov. 6th. Illness began ten days previously with headaches and malaise. Seven days later he became jaundiced. The headaches became less but the jaundice deepened and there appeared in all parts marks like bruises. The appetite became poor. Bowels were very constipated, but the fæces were never pale.

Admission state.—Temp., 97·8°; pulse, 88; general condition poor; drowsy and depressed. Intense orange jaundice; petechial hæmorrhages generalised; large contusion (said to be due to slight accidental blow) over left eye; hæmorrhagic labial herpes, and hæmorrhagic spots on tongue and uvula; tongue red and dry. Abdomen: liver edge extended to three inches below the costal margin; no tenderness or rigidity; spleen not palpable. Urine: sp. g., 1020; acid; albumin and bile present. Fæces: occult blood and bile present. Van den Bergh reaction: serum bilirubin 115 units; phosphatase: 8 units. Bile present in all specimens of urine until death.

Progress.—Patient became steadily worse. On Oct. 31st he passed 72 oz. of urine, and thereafter 10–20 oz. daily. He died on Nov. 6th.

Bacteriological data.—Blood was obtained immediately on admission and inoculated intraperitoneally into two guinea-pigs. Both remained healthy. They were killed and nothing abnormal was demonstrated. No leptospiræ were found in the urine.

Post-mortem findings (Dr. Thomson).—The pleural cavities contained a considerable amount of blood-stained fluid. Trachea and bronchi showed congestion. The right lung had in the upper lobe, posteriorly, two small wedge-shaped areas, each ½ in. in diameter, abutting on the pleura, which suggested recent infarcts. The heart showed extensive fresh hæmorrhages under the endocardium of the papillary muscles. The stomach contained much fluid blood and some small blood clots; petechial erosions numerous, especially near cardia; no gross ulceration. Duodenum normal; bile-ducts patent; pancreas normal. Gall-bladder distended with dark bile; mucosa dark red, suggesting some small hæmorrhages. Liver: slightly enlarged, with smooth capsule; dark olive green on section and friable. Kidneys: both considerably enlarged, weighing 19½ oz.; dark chocolate brown on section and cortex much broadened; glomeruli projected from the cut surface, and some diffuse hæmorrhages could be seen at the junction of cortex and medulla; small pale infarct 6 mm. in diameter in one kidney; pelves of both kidneys distended with blood clot.

Microscopical findings.—Kidney: glomerular tufts not ischæmic; proliferation of Bowman's capsule; tubules showed intense cloudy swelling and round-cell infiltration in places. Infarct in the cortex with an extensive hæmorrhage at its apex. A few hyalinised glomeruli. Liver: bile stasis; moderate cloudy swelling but no necrosis. No spirochætes were found in sections of liver and kidney stained by *Levaditi's method*.

VII

Colliery A. N. O., aged 51. Admitted Feb. 21st, 1935; discharged March 21st. Illness began seven days before admission with feeling of shakiness. Bleeding from nose four days before admission and on two occasions since. Shivered, sweated, and felt weak. Jaundice noticed three days before admission.

Admission state.—Temp., 99°; pulse, 92; bright yellow jaundice; hæmorrhagic labial herpes; tongue dry; no abnormality detected in heart, lungs, or abdomen. Blood pressure 140/70. Blood count: red cells, 3,900,000; hæmoglobin, 80 per cent.; white cells, 19,300 (polymorphs 78 per cent., eosinophils 1 per cent., lymphocytes 19 per cent., monocytes 2 per cent.) Urine: sp. g., 1015; acid; albumin +; bile, +. Fæces: occult blood, ++ on Feb. 25th: negative on March 6th. Van den Bergh reaction: bilirubin 40 units; direct reaction. Phosphatase: 8·2 units.

Progress.—The temperature was very erratic and never went higher than 100°. The urine showed steadily decreasing amounts of bile and albumin and was free from both by March 18th. The jaundice steadily diminished and was scarcely noticeable on discharge. There were no further hæmorrhages after admission.

Bacteriological data.—Blood obtained immediately after admission was inoculated intraperitoneally into two guinea-pigs. Both remained healthy. One was killed on March 5th and no leptospiræ could be demonstrated in any of the organs. Urine obtained on Feb. 22nd (about eleventh day of illness) failed to produce the disease in both the guinea-pigs into which it was injected. Agglutination for *L. icterohæmorrhagiæ* positive up to 1/1000 six months after illness.

VIII

Colliery B. P. Q., aged 36. Admitted April 2nd, 1935; discharged May 13th. Six days before admission he came home from work feeling well. He went to bed and woke up next morning feeling dizzy. He went back to bed and on that day was seized with severe pain especially in head, back, and legs. The pain lasted 2-3 days. On the day of admission he coughed up (?) some clots of blood. The bowels were loose. No jaundice noticed. He had been working as a coal-hewer in a wet part of the pit and his hair showed staining caused by the dye of his cap running, due to water trickling on to his head.

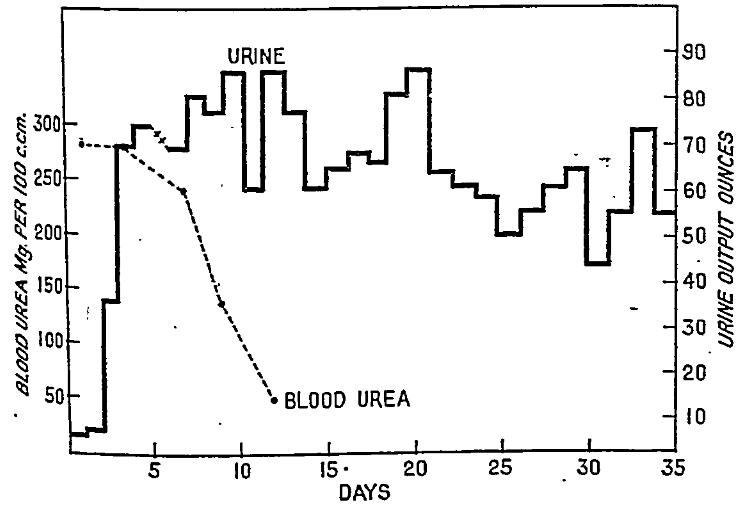

FIG. 1 (Case 10).—Chart of urinary output and blood-urea.

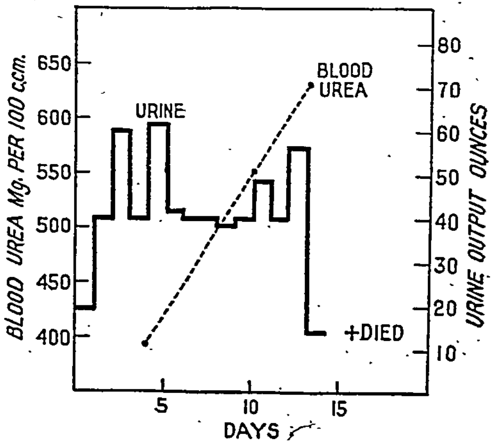

FIG. 2.—Urinary output and blood-urea in Case 11.

Admission state.—Temp., 101°; pulse, 112; very toxic, tongue brown-coated, clots of blood in nares; moderate jaundice; punctate petechial rash over left side of chest and abdomen; no abnormality in heart, lungs, or abdomen. Urine: sp. g., 1020; alkaline; albumin, +; bile, ++. Blood picture: red cells, 3,875,000; hæmoglobin, 84 per cent.; white cells, 10,600 (total neutrophils 95 per cent., lymphocytes 4 per cent., monocytes 1 per cent.). Fæces: occult blood, +. Wassermann reaction negative.

Progress.—At first he became worse. There was severe epistaxis on the day of admission and on the next day. On April 5th there was another severe epistaxis. The jaundice had become deeper. On the 12th he passed a melæna stool. From now onwards he slowly improved, the jaundice gradually faded, and bile and albumin were absent from the urine on discharge. The temperature fell to normal after the first day and never exceeded 99°. The pulse ranged from 70 to 100. When the jaundice had faded he appeared anæmic and a blood count on May 3rd showed red cells, 2,350,000; white cells, 7000; and hæmoglobin, 62 per cent.

Bacteriological findings.—Blood was taken on the day of admission (sixth day of illness) and two guinea-pigs were injected intraperitoneally, No. 1 receiving 2 c.cm. and No. 2 1 c.cm. of blood. No. 1 died 11 days, and No. 2 12 days later. Both animals were wasted and jaundiced. There were subcutaneous and peritoneal hæmorrhages and the lungs showed numerous hæmorrhages. Leptospiræ were present in the liver and kidneys of both animals. Urine was obtained on the thirteenth day of the illness and 2 c.cm. were injected intraperitoneally into a guinea-pig. It died 13 days later. The changes were similar to those in the animals injected with blood and leptospiræ were demonstrable.

IX

Colliery B. R. S., aged 29. Admitted May 2nd, 1935; discharged July 18th. Seven days before admission he complained of general malaise, severe headache, and sweating. Three days later he began to vomit and became jaundiced. The vomit was bright red. Epistaxis began on the third day. Bowels were not opened for five days. Pain in back of legs.

Admission state.—Temp., 99°; pulse, 100; ill and listless; moderate jaundice; blood pressure, 100/70; tongue coated; blood clots in nares; nothing abnormal in heart or lungs. Abdomen distended; tenderness in right hypochondrium; spleen not palpable. Urine: trace of albumin; bile, +; a few pus cells and red blood-cells; no casts. Blood-urea: 85 mg. per 100 c.cm. (June 24th). Fæces: occult blood ++ twice.

Progress.—For the first week he remained rather ill. The temperature reached 101°. There was further slight epistaxis. During the second to the seventh week improvement was slow with occasional evening pyrexia. The liver became palpable and felt hard. The jaundice became much fainter but never quite disappeared. On June 14th the temperature rose to 101°, but subsided on the next day. On the 18th it rose to 99·5° and the jaundice was more obvious. Antileptospiral serum (10 c.cm.) was given. On the 21st and 24th he had rigors. Circumcorneal injection was noted on the 22nd. Antileptospiral serum was again given on June 22nd, 29th, and on July 6th. The temperature reached normal on June 29th and remained there. Convalescence was uneventful.

Bacteriological findings.—Blood obtained on May 3rd (eighth day) failed to produce the disease in a guinea-pig. Urine obtained on May 9th (fourteenth day) was inoculated intraperitoneally into a guinea-pig. The animal died in two days; there was an icteric tinge of the intestines with slight injection; no mottling of lungs; dark-ground examination of liver for leptospiræ was negative. Another guinea-pig inoculated with an emulsion of liver died the next day. A second specimen of urine obtained during the relapse (June 20th) failed to produce disease in two guinea-pigs. Agglutination for *L. icterohæmorrhagiæ* positive up to 1/1000 on July 18th (two and a half months after onset).

X

Colliery D. T. U., aged 32. Admitted May 27th, 1935; discharged June 29th. Illness began seven days before admission with diarrhœa and dull abdominal pain. The diarrhœa lasted for four days and was followed by complete constipation. Passed very little urine and his doctor found solid albuminuria. For 36 hours before admission had passed no urine. Vomited several times and complained of headache and pain in back. The colliery in which he worked had recently been reopened and was very damp. His clothes were often soaked through. No serious illness previously.

Admission state (May 28th, eighth day).—Temp., 97·5°; pulse, 60; very ill and drowsy; tongue brown and dry, breath urinous; no obvious jaundice; Chvostek's sign positive; blood pressure, 90/70. Nothing abnormal found in heart, lungs, abdomen, or central nervous system. Fundi normal. Urine (3½ oz.) withdrawn by catheter was highly coloured but contained no bile; it was "solid" with albumin and contained numerous red and white blood-cells and granular casts. Blood-urea: 285 mg. per 100 c.cm.

Progress and further investigations.—Next day he was less drowsy. Slight jaundice now present; marked conjunctival injection. Urine passed (4 oz.) still solid with albumin, but now giving a faintly positive Gmelin's test for bile-pigments. Blood pressure 110/80.

On the 30th (tenth day) jaundice was well marked, a general golden yellow; copious epistaxis; 34 oz. of urine passed; albumin, ++. Blood-urea: 280 mg. per 100 c.cm. Van den Bergh: direct positive 18 units. Phosphatase 10·6 units.

On the 31st jaundice was more intense; heavy epistaxis; liver palpable two fingers-breadths; occult blood positive 20 seconds. Blood count: red cells, 3,420,000; hæmoglobin, 67 per cent.; white cells, 13,250 (polymorphs 76 per cent., metamyelocytes 3 per cent., myeloblasts 1 per cent., lymphocytes 14 per cent., monocytes 4 per cent., eosinophils 2 per cent.). Antileptospiral serum (10 c.cm.) given intravenously. Patient passed 74 oz. of urine containing only a trace of albumin and moderately bile-stained. From now onwards there was steady improvement. Antileptospiral serum (10 c.cm.) was repeated on June 1st and 4th. The jaundice steadily faded and had disappeared within three weeks from the onset. The urine output never fell below 40 oz. daily and albumin had disappeared on the seventeenth day of illness. The blood-urea fell slowly, being 240 mg. on June 3rd, 135 mg. on the 5th, and 49 mg. on the 8th. At no time did the temperature rise above 99° or the pulse above 90. During convalescence anæmia was noticeable and on June 11th (21 days from onset) the blood picture was: red cells 3,020,000; hæmoglobin, 55 per cent.; white cells, 14,400 (polymorphs 85 per cent.—no immature forms—lymphocytes 12 per cent., monocytes 1 per cent., eosinophils 2 per cent.).

Bacteriological findings.—Guinea-pigs inoculated intraperitoneally with blood obtained on the eighth day of illness and urine obtained during the first and second week remained in perfect health. Agglutination for *L. icterohæmorrhagiæ* positive up to 1/3000 one month from onset.

XI

Colliery A. V. W., aged 56. Admitted June 8th, 1935; died June 24th. Eight days previously illness began with generalised vague pains. On the seventh day abdominal pain commenced, and during the next 24 hours was intense and accompanied by vomiting and hiccup with a tinge of jaundice. The urine had been scanty and bile-stained. Some of the vomit contained blood-stained material.

Admission state.—Temp., 97·8°; pulse, 96; bright orange jaundice; small petechial hæmorrhages over thorax and root of neck; slight itching of the skin; tenderness below the right costal margin, but neither gall-bladder, liver, or spleen palpably enlarged; no rigidity. Blood pressure, 100/56. Urine: sp. g., 1012; acid; bile present; trace of albumin. Fæces: occult blood present. Van den Bergh: direct reaction intense positive; total bilirubin 40 units.

Progress.—On June 10th patient had severe epistaxis and complained of pains in back and legs. Temperature had never been above normal since admission. Testes were painful and extremely tender, but not swollen. Antileptospiral serum (10 c.cm.) given. Next day he was passing very little urine; bowels constipated. Blood-urea: 387 mg. per 100 c.cm. (Fig. 2). Cerebro-spinal fluid: bile-stained fluid under no increase of pressure; colour due to bilirubin, giving direct van den Bergh reaction; protein 0·08 per cent., sugar slightly diminished, chlorides 0·72 per cent., total cell count 64 per c.mm. (all lymphocytes). A further 10 c.cm. serum given and again on the 12th.

On the 14th the jaundice was more intense. More urine was being passed (40–60 oz.), but still intensely bile-stained. Albumin a trace. Complained of pains generally in body and limbs, but especially in the back. Another severe epistaxis. Generalised conjunctival suffusion. Serum (10 c.cm.) was again given. A blood count showed:—

Red cells	3,020,000	Polymorphs	85%
White cells ..	10,625	Lymphocytes	11%
Hb...	63%	Monocytes	3%
Colour-index ..	1	Eosinophils	1%
Reticulocytes ..	1·6%		
Platelets	100,000		

The patient continued to receive 10 c.cm. of antileptospiral serum daily. He was intensely jaundiced and drowsy, passing about 40 oz. of urine per day. Temp., 97°; pulse, 80 (June 17th). Blood pressure, 90/50; blood-urea, 550 mg. per 100 c.cm. On the 18th the urine (40 oz. in all) contained only a little bile; sp. g., 1012; trace of albumin; urea-concentration, 1·62 per cent.; a few leucocytes, no casts seen. Intravenous glucose 200 c.cm. given. On the 19th the liver edge was palpable about an inch below costal margin; spleen not palpable. Blood-urea: 630 mg. per 100 c.cm. On the 21st the blood pressure was 100/60. Urea-concentration 1·64 per cent. Jaundice rather less: no purpura remained. Blood transfusion of 8 oz. given and made up to 10 oz. with 25 per cent. intravenous glucose solution. Antiserum and intravenous glucose continued daily. On June 22nd at 12.30 A.M. the patient was very restless and crying out at intervals. During that day the urea-concentration was 1·58 per cent. in urine. A few red cells and leucocytes were to be seen with granular and epithelial casts. He died on the 24th.

Bacteriological data.—Leptospiræ were found in urine on June 14th. Urine obtained on the 12th (twelfth day) was inoculated intraperitoneally into a guinea-pig and the animal was killed on July 1st. The post-mortem was negative. Blood was inoculated intraperitoneally into a guinea-pig on the 12th and on July 1st it was found that the liver was jaundiced, a few leptospiræ being detected in smears. A portion of liver was inoculated into another guinea-pig on the same day and this animal was killed on July 31st. The findings were: great wasting; a few striated hæmorrhages in lungs; a few infarcts in the kidneys; a few leptospiræ in smears from liver and kidney.

Post-mortem findings (Dr. G. E. Stephenson).—Heart: normal. Lungs: emphysema and chronic bronchitis; some broncho-pneumonia in right upper lobe and recent hæmorrhagic infarct in lower lobe. Spleen: small; no gross abnormality. Liver: average size; dark olive green on section with lobular outline distinct. Gall-bladder contained 1½ oz. light golden yellow bile and debris; no calculi. Kidneys: swollen and soft; capsule thin and stripped easily; surface smooth; cortex swollen and bile-stained; submucosal hæmorrhages in the pelvis. Stomach: numerous submucosal petechial hæmorrhages at fundus and pyloric end. Duodenum and intestines showed no pathological changes. Brain: swollen and œdematous; small subarachnoid hæmorrhage at vertex of right cerebral hemisphere.

Microscopical findings.—Liver: biliary stasis marked; cloudy swelling moderate; no necrosis and no inflammatory cells seen; normal lobular structure well preserved; no leptospiræ found in sections stained by Levaditi's method. Kidneys: much hyperæmia; glomeruli generally healthy though a few showed early sclerotic changes; patches of round-cell infiltration in cortex, and tubules showed well-marked cloudy swelling; no leptospiræ found.

XII

Colliery E. X. Y., aged 46. Admitted June 24th, 1935; died June 25th. Illness began seven days before admission with headache, malaise, and nasal catarrh. Profuse sweating but no pyrexia. Four days later jaundice appeared and quickly deepened. Became delirious and vomited. A hewer in the pit and had "worked wet." There was said to have been another case of jaundice from the same pit.

Admission state.—Temp., 98°; pulse, 96; blood pressure, 90/65; deeply jaundiced; petechiæ scattered over body, most obvious on forearms; circumcorneal injection; Chvostek's sign positive. Heart normal. Lungs: basal râles. Abdomen retracted; liver not palpable. Urine: 10 oz. drawn off by catheter; acid; sp. g., 1019; urea, 1·9 per cent.; trace of albumin; bile, ++; red cells, ++; occasional casts and pus cells. Blood-urea: 567 mg. per 100 c.cm. whole blood. Blood protein: 7·23 mg. per 100 c.cm. serum. Blood calcium: 9·1 mg. per 100 c.cm. serum. Van den Bergh reaction: direct positive; 46 units.

Progress.—Antileptospiral serum (10 c.cm.) given on June 25th. Patient died the same evening.

Bacteriological findings.—Blood was inoculated intraperitoneally into a guinea-pig on June 25th (eighth day). The animal was killed on July 18th; post-mortem negative.

Post-mortem findings (Dr. Stephenson).—Heart: a few subpericardial hæmorrhages; muscle soft and friable; subendocardial hæmorrhages at bases of papillary muscles. Lungs: congestion and œdema; no pneumonia. Spleen: not enlarged; congested. Liver: not enlarged; lobular outline distinct. Gall-bladder: healthy. Left kidney: atrophied, weight 1¼ oz.; capsule thickened and adherent; surface red and granular; cortex greatly atrophied. Right kidney: much enlarged; capsule thin, not adherent; surface smooth; cortex broadened with a few punctate hæmorrhages; hæmorrhages in mucosa of pelvis. Bladder empty.

Microscopical findings.—Right kidney: increased vascularity; glomeruli normal; cloudy swelling in tubules. No leptospiræ found in Levaditi preparations.

Summary

(1) A hitherto unsuspected source of leptospiral infection is present in certain coal-mines in Northumberland and Durham. (2) Twelve cases of Weil's disease among miners are described with a mortality of 33 per cent. (3) There was a history of working in damp rat-infested seams in all except one case. (4) The diagnosis was confirmed by bacteriological examinations in nine cases. (5) Interesting features were very high blood-urea figures in three cases and a lymphocytosis in the cerebro-spinal fluid in two cases.

We wish to thank the honorary medical staff of the Royal Victoria Infirmary and the medical superintendent of the Newcastle General Hospital for permission to publish cases under their care; Dr. H. J. Slade of the bacteriological department of the Royal Victoria Infirmary and the staff of the Durham University College of Medicine bacteriological laboratory for carrying out guinea-pig inoculations; and Major H. C. Brown of the Wellcome Bureau who very kindly performed the agglutination reactions.

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INTERNATIONAL PHYSIOLOGICAL CONGRESS

(Concluded from p. 445)

AFTER the official closing of the Congress in Moscow on the afternoon of August 17th the members did not immediately scatter. In the evening they were entertained to a banquet in the Kremlin by the members of the Soviet Government, headed by the President of the Council of People's Commissars, supported by many officers of the Red Army. An opportunity for sightseeing in the Kremlin was unfortunately not offered, and the glimpse afforded at the reception was somewhat tantalising. The hall of St. George in the Great Palace, where the banquet was held, was all of white marble with pillars set into the wall, and must have impressed most of the guests as the most splendid banqueting hall they had ever seen. Outside the great windows the moon showed up the green and golden clustered domes of the cathedrals of the Archangels, of the Assumption, and of the Annunciation.

On the next day many of the Congress members went to a great air display, while others preferred to spend their time in visiting scientific institutions, including especially the Institute of Animal Breeding and the Central Institute of Nutrition. In the former, demonstrations were given of the methods of artificial fertilisation of larger and smaller farm animals, which the Soviet workers have learned and adopted with success. Where the supply of pedigree sires is small and the geographical area to be covered enormous, such a procedure, with distribution by aeroplane, has obviously great advantages—provided that it can be made reasonably successful. Practical use was also being made of production of artificial heat at convenient times, by injection of œstrin, and of diagnosis of pregnancy, especially in mares, with the Aschheim-Zondek reaction.

The Central Institute of Nutrition in Moscow consists of laboratories and a clinic of 125 beds in a separate building. The laboratories are concerned with scientific studies which are mainly in connexion with practical problems of nutrition. Since in Moscow alone 2½ out of the 4½ million people are fed in public dining-rooms, with three hot meals a day, it is obvious that there is plenty to do, if nutrition is to be placed on a sound basis, qualitatively and quantitatively. Particular attention was being paid to the changes which foods undergo in the process of manufacture, to the designing of containers for the distribution of food, and to the devising of flavouring materials which could be prepared on the large scale and which would keep.

Dietary surveys throughout the U.S.S.R. are also undertaken, and Prof. Moltschanowa had recently returned from Tashkend in Central Asia with an incredible amount of luggage, the fruits of a dietary survey, accompanied by a study of the mineral balance and the basal metabolic rate of the people consuming the diets. All the materials collected had to be worked up in Moscow. In the vitamin department Dr. Jarussowa, under Prof. Lavrov, had been engaged on the practical problem of devising a cheap antiscorbutic which could be consumed by people engaged on construction work in labour camps in Siberia, where the ordinary forms of fresh food are difficult to obtain. A potent concentrate has been prepared from spruce needles, which is said to have met the requirement adequately.

In the clinic connected with the Institute of Nutrition patients were selected for purposes of investigation who were suitable for a treatment exclusively dietetic—particularly persons suffering from liver and kidney diseases, from acute rheumatism, from gastro-intestinal diseases, and from some forms of heart disease. Conditions such as gastric ulcer are treated as constitutional rather than local diseases, and the idea seems to be prevalent in the U.S.S.R. that drugs should be avoided wherever possible. The patients seemed to be very well cared for, but it was of course impossible in a single visit to judge of the success of the methods used. This last truth, indeed, applies to the formation of any opinion with regard to the state of social welfare in the whole Soviet Union. Only those who have made more than one visit are competent to report whether progress is being made or not, and it is on the making or not making of progress that a favourable or an unfavourable verdict must be based.

In judging the hospitality of the Government of the U.S.S.R. towards foreign scientists, however, every member of the Congress is an expert, and there is no doubt that the verdict would be completely unanimous. A more delightful welcome has never been offered.

MEDICINE AND THE LAW

Motorist's Consent to Medical Examination

SOME months ago a High Court judge invented a telling method of challenging the medical evidence adduced against motorists who are charged with driving a car while under the influence of drink. He impaled the witness upon the horns of a dilemma. The police surgeon had no right to examine the motorist without the latter's consent: a drunken man cannot give consent. Either, therefore, the motorist was sober because he gave a valid consent to be examined, or else, if he was drunk, his condition could not be described and the prosecution must fail for want of evidence. Alert advocates have naturally made use of this weapon in defence of motorists, for what it may be worth. Thus at the South Western Police-court last month the point was taken by Mr. Laurence Vine on behalf of Mr. R. M. Hutchinson, better known as Harry Tate, the comedian. Dr. R. Anderson, the divisional surgeon, was describing his examination of the accused when Mr. Vine objected that there was no legal right to examine a man who is under the influence of drink. The witness said he had asked the defendant's permission to examine him. "You must have thought," suggested Mr. Vine, "that he was in reasonable possession of his faculties or you would not have asked such an important question about his consent to the examination." The witness replied that he asked the question before he had come to any decision as to Hutchinson's condition. The case, which was remanded, presented no other feature of interest except that the magistrate queried whether it was quite a fair test to ask a man of 63 to stand on one leg—"some elderly people may not be able to stand on one leg, drunk or sober."

When Mr. Justice Rigby Swift first introduced to the public this forensic dilemma about medical examination, the Home Office and the Directorate of Public Prosecutions are believed to have been taken somewhat by surprise. Later the point was viewed with more equanimity. It was a better point under the earlier law when a motorist could be punished for being drunk while in charge of a car than under the present law (Section 15 of the Road Traffic Act, 1930) whereby it is an offence to be merely "under the influence of drink." Magistrates may often find themselves able to decide that a man was not too drunk to have consented to be examined and yet drunk enough to have imperfect control of a car. At common law a drunken person is not incapable of contracting. His contracts are voidable only if he was, at the time and to the other party's knowledge, unable to understand the effect of the transaction. In criminal cases the drunkard is said to obtain no privilege from his condition; he has voluntarily abandoned control of himself and, in Sir E. Coke's words, "what hurt or ill soever he doeth, his drunkennesse doth aggravate it." The law to-day is unlikely to tolerate an argument which would prevent a medical witness from describing the defendant's condition when that condition is the main element in the alleged offence. The accused would gain little if the police surgeon states "his condition was such that in my opinion he was unable to give consent to medical examination."

The Taking of Fingerprints

If medical examination without the examinee's consent can be regarded as a technical assault, it is akin to the taking of a person's fingerprints without authority. Last week some juvenile offenders were being dealt with by magistrates when a parent protested that his son's fingerprints had been taken, and asked (though without success) that they should be destroyed. It is nowadays forbidden to use the words "conviction" or "sentence" in connexion with a child or young person who is dealt with summarily (Section 59 of the Children and Young Persons Act, 1933), and, if we are no longer to brand juvenile offenders as criminals, the protest was natural. The police, however, may well wish to have some record (if proper power exists to take it) whereby they can check the activities of young persons who get into trouble. It is necessary to use every aid to detect the identity of an offender even if, when brought before the magistrates, the offender suffers no severe penalty. No authority has any power to take persons' fingerprints, unless they consent, without first having such persons committed to prison. It is not quite clear why the boys, in the recent case just mentioned, had been so treated. In prison the procedure is presumably governed by the Prison Rules of 1933. These prescribe that the name, age, height, weight, particular marks, and such other measurements and particulars as may be required are to be recorded when the prisoner is admitted to prison and from time to time afterwards in such manner as may be directed. He may also, "if required for purposes of justice," be photographed on reception and subsequently; but no copy is to be given to any unofficial person. In some countries the taking of fingerprints is allowed full scope for civil purposes; in England there is a fierce prejudice against the process for any but criminals. We do not object to having our births, baptisms, addresses, and marriages recorded but we find it degrading to have our fingerprints registered. Persons found wandering and suffering from supposed loss of memory cause endless trouble before they are satisfactorily identified; bodies cast up by the sea or found dead elsewhere remain mysteries; innocent persons are arrested and inconvenienced for want of easy proof of their bona fides. In all such cases anxiety and expense are caused because there is no universal system of registering fingerprints. Classification of skin impressions could index the whole human race. In England public opinion tolerates the system for the purpose of criminal records only.

Tetanus after Appendix Operation

An inquest was concluded at Rochester on August 29th upon the death of Miss Alma Leworthy from tetanus. The deceased, aged 32, had undergone an operation for appendicitis in St. Bartholomew's Hospital, Rochester. Dr. Schulenberg, resident surgical officer, described the results of his post-mortem examination. The operation wound, he said, was soundly healed. It was examined for pieces of catgut; only a piece of thread was found; this was kept for culture. Asked by the coroner as to the source of the tetanus germs, the witness stated that the germ must have entered the patient's body while she was in hospital, and the abdominal wound would be the site of infection. He could not say if it was due to the catgut. Instruments and catgut were sterilised; but this was an abdominal operation and tetanus might arise from the intestines. The tetanus germ was found in the intestines of a small proportion of people; it might lie dormant till it entered the system through a wound. The coroner read a report from the pathological department of the Ministry of Health. It stated that there was no evidence of *Bacillus tetani* in the samples of catgut sent by Dr. Schulenberg, but that cultures taken of tissue gave convincing evidence of the existence of such bacilli. The witness observed that the report merely proved that death was due to tetanus; it did not explain the source of infection. A theatre sister described to the coroner the process of sterilisation of catgut at the hospital, as it had been in operation for the last eight years. In summing up, the coroner referred to the possibility of the tetanus germs entering an abdominal operation wound from the intestines, no matter how careful the surgeon might be. He considered that the high reputation of the hospital had not been tarnished. The jury returned a verdict of death from misadventure and exonerated from blame all concerned in the case.

PANEL AND CONTRACT PRACTICE

Extension of Medical Benefit

It is generally agreed that medical benefit under the National Health Insurance Acts, although good so far as it goes, does not go far enough. From that point however two lines of thought diverge. The adherents to the one line of thought say, "let us extend medical benefit to the dependants of insured persons and thus make national health insurance an integral part of the general health services of the country." Those who take the other point of view say, "let us improve medical benefit itself and endeavour to provide specialist services, laboratory services and the like, to those persons who are insured and who are, therefore, paying for it." The National Association of Insurance Committees adheres to the latter view, and in conjunction with the National Conference of Friendly Societies has decided to call a conference for the purpose of discussing an extension of the services at present available to the existing body of insured persons. The medical profession will be represented at the conference, at which will be discussed the provision of expert medical advice and treatment and laboratory services to supplement and render more effective the general practitioner service for insured persons, in the form of an independent scheme organised under the general direction of the Minister of Health as an integral part of medical benefit.

A Revised Clause

The new Medical Benefit Consolidated Regulations are already in proof, and it is expected that they will be issued very shortly. One amendment in the terms of service, which form the first schedule to the regulations, will be of special interest to insurance practitioners. Under the revised Clause 7 (3) an insured person who, having failed to make the practitioner aware of his claim to be entitled to medical benefit, has incurred expenses either by way of payment or by receiving an account, may apply to the insurance committee for an adjustment of the matter. The committee, if satisfied of the applicant's title to benefit and of the bona fides of his application, may, if they think fit, either refund the amount charged and debit the doctor's account or require the withdrawal of the account rendered; in either event they must credit the practitioner with the remuneration to which he would have been entitled if the applicant had been attended by him as a temporary resident. Applications for consideration under this clause must be made by the insured persons within one month at present, and it is by no means in every case that insurance committees accede to the applications. Superior persons who cannot be bothered with the panel, and so on, until they have incurred expense or received an account meet, as a rule, with short shrift at the hands of committees. But there are more worthy cases—e.g., the man who has been out of work for a long time and whose title to sickness benefit has perhaps expired, and who may think (who can blame him?) that his title to medical benefit has also expired; or the woman who has been married and has been transferred to Class "K." It is proposed in future to extend the period of one month to three months, and to make the clause applicable to cases where a bona-fide mistake has been made by a doctor either in charging a fee or in rendering an account, irrespective of whether the patient is, or is not, on his list. Hitherto Clause 7 (3) has not applied in cases where the patient was on the doctor's list and, strictly speaking, in any case where a doctor had charged for treatment rendered to a patient whose name was in fact included in his list the case fell to be dealt with by the medical service subcommittee. Obviously there is here a divided responsibility. It is the applicant's duty to make it clear to the doctor that he is an insured person, but on the other hand the doctor has been supplied by the insurance committee with a list of his patients in the shape of forms of medical record. Cases have frequently arisen in which, there being no suggestion of bad faith on the part of a doctor, insurance committees have turned a blind eye to the potential breach of the terms of service and have adjusted the matter, with the consent of both parties, by debiting the doctor and refunding the amount paid to the insured person. Adherence to the letter of the regulations would have led to quite unnecessary hearings by service subcommittees. The revised clause will give them proper authority for dealing with genuine mistakes in another way, and it will be welcomed alike by doctors and by committees.

An Unsubstantiated Complaint

Practitioners may sometimes have to defend themselves against accusations which have little if any substance in fact, but this aspect of the case may not become apparent until after a protracted hearing, as in the following case recently investigated by the London medical service subcommittee.

An insured woman, 67 years of age, was given by her daughter a dose of furniture polish one evening in mistake for medicine. The doctor, who was already attending her for subacute pleurisy, paid a visit the following morning when the woman complained of severe headache. It was only after leaving the house that he met the daughter in the street and was told of the mishap. Thereupon he returned to the house and issued an order for the patient's admission to hospital, warning the relatives of the possibility of a sudden collapse due to poisoning. He gave instruction that the remainder of the polish should be taken to hospital with the patient in order that its nature might be ascertained. Later in the day the son called and told him that his mother would not go into hospital and that her relatives did not want her to go, adding that he understood the furniture polish was harmless. The doctor, mindful of the possibility of delayed collapse sometimes associated with camphor poisoning, insisted on the patient's removal to hospital, stating that if his instructions were not followed he would not provide further treatment. He did however instruct the son to report during the evening on the patient's condition. No report was made, but three days later the son called and asked the doctor why he had not visited the patient. The doctor reminded him of their conversation, and the following day he sent a note to facilitate the insured person's transference to another doctor, adding the name and address of a doctor with whom he had arranged for treatment to be provided, if desired, by the relatives.

The relatives complained that the doctor had improperly refused to provide treatment for the insured person and that in consequence it was necessary to obtain the services of another doctor. In the view of the medical service subcommittee (which was adopted by the insurance committee) there was no refusal to attend. The doctor saw the patient twice on the morning of Jan. 18th, and did the proper thing in the circumstances when he advised immediate removal to hospital and gave the necessary document to facilitate admission. By refusing to go the patient (and her relatives) took a very grave risk. The other doctor who was called in on Jan. 19th evidently found nothing urgent in the patient's condition as he did not call again on the next day. What the relatives could and should have done was to have gone back to the doctor and told him that the patient had not entered a hospital, and, if her condition necessitated it, asked him again to attend. As they did not do this the committee took the view that the expenditure incurred in obtaining other treatment was neither reasonably nor necessarily incurred and the doctor could not be held liable for it. Subsequently the doctor arranged for a deputy to attend on his behalf, if so desired, pending arrangements for the transfer of the insured person and he gave the necessary facilities for such transfer. The committee saw no reason to criticise his action.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

THE STUDENTS' OLYMPIAD

THE meeting to decide the high-school athletic championship of the world ended here on August 18th. Twenty-eight nations were represented, and in the final results Hungary was first (481 points), Germany second (465), England third (146), Czechoslovakia fourth (102), France fifth (101), and Japan sixth (88). The city of Budapest entertained the competitors at receptions, banquets, and excursions, and the arrangements made for their accommodation were admirable. As it was holiday time it was possible to find quarters for many of them at schools and colleges. Their food was strictly supervised, and as a result no digestive or gastric illness occurred, though the guests took full advantage of the abundance of varied and cheap fruits which were available. One case of enteric fever was reported but as the patient had a high temperature two days after he left Stockholm he must have been infected in Sweden. There was no dysentery and, apart from one fractured wrist, no serious accident.

TWO BUDAPEST DOCTORS FIGHT A DUEL

Two young doctors, both junior dressers in the surgical section of the New St. John's Hospital, disagreed on some professional matter just before preparing for an operation. The disagreement became heated, and finally the disputants so insulted one another that a challenge to a duel was issued and they fought with swords in a well-known Budapest fencing hall. The fight lasted about ten minutes and one of them received a deep cut on his forehead, penetrating to the periosteum, which required 17 stitches.

RESTRICTION OF SALE OF CAUSTIC POTASH

Caustic potash is used by every housewife in Hungary on washing-day and is sold by every grocer in the form of long sticks. This closely resembles the cheapest kind of sweet popular among poor children, and many accidents have thus been caused. During one fortnight no fewer than 18 children between the ages of two and five suffering from caustic poisoning were brought to the New St. John's Hospital. Many cases of suicide and attempted suicide also are due to caustic potash, for every servant girl deceived in love can get hold of it, and they are apt to disregard the fact that the death it brings is a terrible one. The number of such cases has long caused concern. A few years ago the Minister for the Interior issued an order regulating the sale of caustic potash, but this did not seem to remedy the evil. A new Act now come into force is much more strict. It decrees that caustic potash is to be regarded as a poison, and is to be indicated in the pharmacopœia with a cross. When caustic is sold it must have a label marked with a skull and another label on which it is stated that caustic potash is a deadly poison and is to be kept under lock and key, while especial care must be taken that it does not get into the hands of children. Anyone who sells caustic must call the attention of the customer to its dangers every time a purchase is made, even though the customer has already bought the article many times from him. Hitherto shopkeepers selling caustic without a licence or failing to call the customer's attention to its dangers have been guilty only of a misdemeanour. But now, if negligence in this respect leads to accident or suicide, he will be punished for a felony.

DRINK MORE WINE

The production of wine is one of Hungary's most important industries, but restrictions imposed by other countries have reduced exports to such an extent that it is threatened with disaster. The home consumption of wine, despite its low price, has also fallen. In order to give the industry a fillip it has been arranged that the authorities shall supply a daily ration of half a litre of wine to every soldier in the army. The soldiers are glad to promote the interests of the winegrowers in this way.

TAXATION OF THE CHILDLESS

In view of the falling birth-rate of the last ten years the ministerial council has accepted the draft of a Bill for the taxation of bachelors, married couples without children, and married couples with only one child. According to this scheme the income-tax for bachelors will be raised by 25 per cent., for childless couples by 15 per cent., and couples with one child by 10 per cent. Whether this will lead to an increase in the birth-rate is as yet problematical. But since the decrease in the birth-rate is due to the present economic depression it is probable that only a general improvement in the financial conditions and better prospects will make a change.

PARIS

(FROM OUR OWN CORRESPONDENT)

SIGNS OF THE TIMES

ECONOMY is the order of the day here, with increased taxation, decreased style of living, and a general post in the course of which we all do our best to encourage our neighbours to be honest. An example of such vicarious activity in the matter of income-tax has recently come to light. A surgeon attached to a hospital admitting paying patients discovered one day that the inspector of taxes had been scrutinising the entries made in the books of the hospital in order to ascertain from a new angle what were the fees the surgeon was charging his patients. As the books in question contained references to diagnoses, the enterprising inspector exposed himself to a conviction for the violation of professional secrecy—a subject on which French legislation is very emphatic. The incident is, therefore, not likely to recur; but is symptomatic of the present situation. It is proposed to save a quarter of a million francs a year in the budget of Paris—at the expense of the medical profession. This economy is to be effected by the discontinuation of medical certificates testifying to the birth of a child. The *Syndicat des Médecins de la Seine* has decided to reduce the fees charged by its members by 10 per cent. as a spontaneous gesture of solidarity and patriotism. With his rent reduced by 10 per cent. and with corresponding reductions in the cost of his gas, electricity, and coal, the doctor who forgoes a tithe of his professional income in a "gesture of spontaneous patriotism," gains as well as loses in this period of economic upheaval.

ANTIRABIC TREATMENT AT HOME

Dr. P. Remlinger and Dr. J. Bailly,[1] of the Pasteur Institute in Tangiers, whose bacteriological studies have brought them deserved prestige, have attacked the tradition of some 50 years' standing that everyone bitten by a rabid animal should be sent to a Pasteur Institute, however far away it may be, there to be treated for some 15 to 25 days, according to a mystic ritual. During the past ten years there have been signs of revolt against this centralisation of orthodoxy to which Italy, Russia, Portugal, India, and Japan have all conformed. Since 1925 Prof. Puntoni, of the Anti-rabic Institute in Rome, has been distributing a carbolised vaccine to a great number of antirabic dispensaries. His views as to the harmlessness and potency of the virus of rabies treated by carbolic acid have been confirmed in many quarters, and the statistics of decentralised vaccination with a dead vaccine are said to show that it is in no respect inferior to treatment with vaccines prepared by attenuation of the virus at a central Pasteur Institute.

THE HISTIDINE TREATMENT OF GASTRO-DUODENAL ULCERATION

Prof. Emile Aron, of the medical faculty of Tours, has for some time been studying the effect of daily injections of histidine on the experimental gastroduodenal ulceration in dogs. Since Jan. 1st, 1933, he has also treated some three score human patients in like manner and with results as encouraging as those recently published by Dr. E. Bulmer.[2] With regard to the rationale, Prof. Aron finds that histidine does not act merely by relieving pain, but also by changing the "anatomical evolution of the lesion." This explanation sounds a trifle vague, and there is more precision in the description given of the technique of the injections and of the results achieved. The latter are the more impressive because most of the patients were treated under ambulatory conditions, with few dietetic restrictions, and with only small doses of atropine to supplement the subcutaneous or intramuscular injections of histidine.

CENTENARY OF DR. MAGNAN

Dr. Valentin Magnan, who died on Sept. 27th, 1916, was born in 1835. To the present generation of psychiatrists in other countries than France he is now little more than a name. Yet, with only two or three exceptions, he did more for practical and clinical psychiatry than any other Frenchman. As a clinician, he was tireless in the detection and correlation of signs and symptoms of mental disease, and by defining certain morbid types he did much to promote both diagnosis and prognosis. The mental hospitals with which his name is associated are the Antiquaille of Lyon, the Bicêtre, the Salpêtrière, and the Sainte-Anne. He was curiously like Pinel in many respects—the same clinical acumen, the same kindly devotion to the happiness of each patient. Though Pinel had already done much to make the treatment of the insane more humane and had achieved immortality as "the man who broke the lunatics' chains," Magnan in his early days found much need for reform. Chains were dispensed with, but not isolation cells nor strait-jackets. Some 8 per cent. of the subjects of delirium tremens are supposed to have died from the effects of mechanical restraint. Magnan's substitute for this strait-jacket was the bed. He put his patients to bed as soon as possible and kept them there until his clinical examinations were completed and the patient had had all the rest the bed could give him. Magnan was, in fact, the apostle of passive restraint and rest in bed. Above all, he created and maintained the tradition that because an asylum happens to be a public institution, it must never be allowed to degenerate into an impersonal machine whose victims feel that human kindness has gone out of their lives.

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[1] Presse méd., July 27th, 1935, p. 1195.

[2] THE LANCET, 1934, ii., 1276.

CORRESPONDENCE

ADHESIVE STRAPPING AND THE PATCH-TEST

To the Editor of THE LANCET

SIR,—Since I adopted the methods of Mr. Frank Romer in 1923 I have used adhesive strapping for the support and immediate function of many thousands of injured joints and muscles, encountered among successive undergraduates in Cambridge. Naturally time and experience have led to modifications in actual technique—e.g., I now use an under-layer of Elastoplast, followed by "interlocking" strapping. The fact remains, however, that I can claim to have applied a vast amount of strapping to the human skin. The annotation in your issue of Aug. 17th (p. 382) rightly divides strapping dermatitis into (1) mechanical, and (2) allergic. It is mainly concerned with the latter variety, the ways of employing the "patch-test," and the possibility of "reaction delayed not only 24–48 hours . . . but for as long as 14 or even 24 days." It therefore appeals for "standard conditions" among different research workers.

Now such lengthy preliminaries may be possible before deciding upon the use of strapping in chronic "gravitational affections of the legs," but where a recent injury demands prompt decision and treatment it is impracticable to embark on prolonged tests. In face of this, it is happily my experience that sensitisation dermatitis is extremely rare in practice, and that its incidence is even less since the introduction of elastoplast. I would go so far as to say that it is almost negligible. With regard to the "mechanical" variety, and taking the ordinary sprained ankle for illustration, it is true that walking "from the word go" may incur trauma by pressure of the creasing on the skin over the antero-inferior aspect of the joint. This however is prevented by daily reapplication for the first few days, as the swelling recedes, and the formation of shifting creases thereby. Opportunity is thus incidentally afforded for inspection of the whole area, and for the early discovery of any allergic tendency.

It would therefore appear that neither the bogy of allergy, nor the academic interest of varied "patch-tests," is commensurate in importance with the enormous saving in sick-wastage after sports injuries, to be gained from the immediate employment of strapping, properly applied. As I have recently written (Camb. Univ. Med. Soc. Mag., June, 1935), "Unnecessary sick-wastage and lasting disabilities, to say nothing of blighted ambitions, result from delayed and obsolete treatment. It is insufficiently realised that, on a less dramatic scale, a severe muscular or ligamentous injury may be as much a surgical emergency as the 'acute abdomen.'"

I am, Sir, yours faithfully,

R. SALISBURY WOODS.

Cambridge, August 26th.

To the Editor of THE LANCET

SIR,—Your annotation raises the question of dermatitis due to adhesive plaster. Some years ago I carried out a small research on the same lines as Schwartz and Peck and came to the same conclusion—viz., that the resinous constituent of the plaster caused the trouble. This constituent is the main variable in the different makes of adhesive plaster, and explains the frequent experience of one make of plaster causing more dermatitis than another.

In my experience in the treatment of ulcers and phlebitis of the legs with Elastoplast, dermatitis takes one of four forms.

1. Prickly heat from retained perspiration in hot weather.
2. Circular patches of dry eczema in the upper part of the leg.
3. A severe eczematous process around the ulcer where it seems that the combined effect of the discharge and the plaster is too much for the skin.
4. An acute allergic process not only affecting the whole leg and causing blisters of the feet, but also producing severe urticaria of face, neck, and forearms. This dermatitis may develop on the first application of the plaster, or may appear after some time owing to sensitisation occurring.

Types 1 and 2 can in most cases be ignored, and the plaster applied more tightly, or in nervous patients the elastoplast applied over a gauze bandage or a thin silk stocking. In type 3 I cover the ulcer and the surrounding skin with strips of Ceraban and then apply elastoplast over this. In type 4 elastoplast must at once be stopped and ceraban used; if then dermatitis persists, ichthopaste bandages; and if it still persists, crude coal tar ointment is applied under the ichthopaste bandages. I have also noticed that all forms of eczema are more likely to develop when the bandages are not applied tightly and evenly.

It must be emphasised that this complication of the treatment of gravitational conditions of the legs is not really serious, and I much regret that some writers have gone so far as to recommend the return to Unna's plaster on account of a rarely occurring complication which can be easily overcome. The application of Unna's plaster is a messy and laborious method of treatment which does not appeal to the busy practitioner or work well in hospital out-patient departments, and it must not be forgotten that Unna's plaster also produces at times a very intractable eczema. After seven years of treating ulcers with elastoplast I remain very satisfied with the results, and I keep constantly under treatment a much larger number of cases than could possibly be handled by any other method.

In superficial phlebitis the good results have to be seen to be believed; the gain to patients in comfort and time, and the expense saved, are such that I do not think the method can be improved upon or should be abandoned because of an occasional case of eczema.—I am, Sir, yours faithfully,

A. DICKSON WRIGHT.

Wimpole-street, W., August 28th.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—Dr. Thayson in his interesting article states that he has found no mention of the above condition in the Danish, English, French, and American text-books and monographs to which he has access. A careful and accurate description of a condition which appears to be identical with *proctalgia fugax* was published in the *Glasgow Medical Journal* of September, 1917, by Mr. Alex. MacLennan, under the title, "A Short Note on Rectal Crises of Non-tabetic Origin." This article is based upon a considerable experience, and Mr. MacLennan concludes that "the lesion is certainly a neurosis, although it affects persons not of a neurotic temperament and otherwise in sound health." He recommends the use of chloroform vaporoles ♏3 (B.W. & Co.) during the attack.

I have had two such cases under my care, both males. In the first the attacks began at the age of 16, and continued till he entered the Army at age 30. During his four years in the Army the attacks ceased entirely. On his return to civil life they recurred with extreme severity, and interfered seriously with his work as a tram-driver. Examination of the rectum under anæsthesia was negative. The attacks lessened in frequency and severity and disappeared some years ago. The second case was that of a man aged 37, married, with one child 10 years old. He had three attacks in two years. He indulged in coitus interruptus, and since this was stopped, a year ago, he has had no further attack.—I am, Sir, yours faithfully,

Bradford, August 22nd. PETER MCEWAN.

To the Editor of THE LANCET

SIR,—My attention was attracted by Dr. Thaysen's article to a case recently under my care.

The patient is a man, previously fit, who complains that he has lost weight for a few months. He also complains of easy fatiguability, anorexia, nausea, morning cough, and vomiting of mucus. During the last six to nine months he has had three or four attacks of pain just at the top of the anal canal. The pain he describes as gnawing or cramp-like, rising gradually to an unbearable crescendo. During the first attack, which lasted for an hour, he sought in all ways to obtain relief, by walking, defæcation, and the insertion of a finger in the rectum without amelioration or increase of pain. It was only with the adoption of a completely doubled-up squatting position with finger tips touching the floor that relief came. The position of defæcation did not apparently allow sufficient flexion for relief. The patient now aborts every attack in the manner described, so that no attack now lasts as long as the first.

Rectal inspection disclosed only a few very small piles, but on examination with the finger the muscular wall of the anal canal seemed to grasp the finger tightly, and when the finger tip touched the fibres of the levator ani surrounding it the patient said "That is the spot where I get the pain." It seems to me that a cramp of portions of the levator ani causes the symptoms (1) because the pain is analogous in character to muscular cramp elsewhere; (2) because of its tendency to spread and to involve the rest of the muscle, even "into the entire pelvic region"; (3) because it occurs, as in this case, during periods of fatigue; (4) because it is prone to arise in a muscle which has recently been excited—in Dr. Blyth's cases the symptoms followed masturbation; (5) because it appears when the patient is getting warm in bed, as happens with cramps in other parts; (6) because of its relief by stretching during the adoption of the squatting position.

I am, Sir, yours faithfully,

Ilford, Essex, August 28th. R. N. C. SMITH.

To the Editor of THE LANCET

SIR,—About 1904 when working in the pathological laboratory of a hospital the question of temporary pain in the rectum was raised, and at least five of those present were able to discuss the symptoms from personal experience. My brother and I were able to compare notes since both of us had had an attack of sufficient severity to cause loss of consciousness. Neither of us was able to attribute the attacks to any cause, nor were they more frequent when run down than when fresh from a holiday. In my own case about half the attacks followed defæcation before retiring; experience taught me that however pressing the desire to empty the bowel during an attack an attempt would aggravate the pain. The anal sphincter was not in spasm. Local heat was the only treatment which seemed to relieve.

Several of my patients seeking advice for some other trouble have told me that they suffered from this discomfort from time to time. It must be a fairly common complaint. Only three patients have sought my advice for it alone. One was a successful K.C., a very highly strung individual who had to cease appearing in court because he knew that rising to plead would bring on an attack. He could not believe that the pain was not due to a growth, and therefore he asked to be examined with a sigmoidoscope. This was arranged to be done under an anæsthetic at 4 P.M., and shortly before he said to me, "Is this not hard lines? For months I have had no appetite and just to-day at lunch when I was really hungry I was allowed only soup." The only female patient with the complaint had sought advice at many sources. Since the attacks were spoiling her life I advised treatment by suggestion. Although she toured Europe she did not succeed in finding any doctor who was able to hypnotise her.

The object of this letter is to seek information. Many of the subjects who have had these attacks have suffered from migraine. Migraine often ceases as age advances. In my own case the attacks have diminished in frequency and intensity pari passu with those of migraine; this suggests the possibility that it is a manifestation of that complaint. Many medical men have attacks of proctalgia fugax. May I ask them to inform you whether they have migraine too. I am, Sir, yours faithfully,

August 27th. M. C. P.F.

BACTERIOLOGY OF RHEUMATISM

To the Editor of THE LANCET

SIR,—I should be greatly obliged to Prof. Douglas Wilkinson if he would publish the reference to the paper in 1886 in which Mantle "reported the *growth* of a diplococcus from the blood and joint fluid of a child with acute rheumatism." The word "growth" I have put in italics. I knew Dr. Mantle personally, and always gathered from him that he described and illustrated a diplococcus in the blood and advanced the theory that the disease was of microbic origin; important points which were given due credit in "Researches on Rheumatism" (p. 94). We (Poynton and Paine) however thought that in 1899 we first "grew in pure culture," and so isolated the diplococcus in this country. It is my duty, whatever is thought of this diplococcus, to correct in public the statement inferred in our work that we were the first to isolate and grow the diplococcus in this country if 13 years before this Mantle had succeeded.

I am, Sir, yours faithfully,

Bath, August 24th. F. JOHN POYNTON.

CERTIFICATION OF DEATH

To the Editor of THE LANCET

SIR,—Dr. Percy Stocks concludes his analysis (published in your issue of August 17th) by referring to the disappointment of the General Register Office at the failure of the new death certificate to improve definition in certification.

The form of certificate is not beyond criticism, but I wish here to draw attention to one way in which the registrar's desire for accurate information is defeated. Any person, on payment of a small fee, may inspect the supposedly secret certificate at the Registrar's Office, and industrial insurance companies regularly require that death claims should be substantiated by the production of a copy. Frequently a working family is entirely dependent on insurance for the funeral expenses, and find that payment is withheld on the grounds that the certificate includes some conditions which may have existed before the policy was taken out. The fear of this is a constant cause of refusal of consent for autopsy. No medical examination is made before a proposal is accepted, a mere declaration of previous good health being required from persons who are almost wholly ignorant of medical terminology. A practitioner who knows that a morally justifiable claim may be legally defeated on such grounds will be sorely tempted to frame his certificate in such a way as to ensure justice at the expense of statistical accuracy.

A thorough inquiry into the conditions of so-called industrial insurance is, despite existing legislation, designed to protect insured persons from exploitation, highly necessary and long overdue. Benefits are quite disproportionate to the premiums required, overhead costs are scandalously high, and the profits made are considerable. I will give one instance from personal experience of the way in which the less scrupulous companies behave.

> A child's life was insured as a result of canvassing by an agent at a time when the child was temporarily at home "on holiday" from a residential school for children with rheumatic heart disease, a fact well known to the agent. Later, the child died during another attack of acute rheumatism, and the certificate was entered as "Acute rheumatic carditis with previous chronic rheumatic carditis." The insurance company refused payment until the parents consulting me I threated publicity.

Incidentally, I would be obliged if the registrar would indicate how such a death can be accurately fitted into the rigid "due to" clauses of the present certificate.

I am, Sir, yours faithfully,

DUNCAN LEYS.

Birmingham, August 20th.

THE DOSAGE OF ALKALI

To the Editor of THE LANCET

SIR,—In view of the facts published by Dr. Wilfrid Oakley in THE LANCET of July 27th (p. 187) under the heading of Alkalosis arising in Treatment of Peptic Ulcer, it is evident that the giving of alkali in the treatment of peptic ulceration needs close control. The formula of pulvis bismuthi compositus, which is indexed in the Extra Pharmacopœia of Martindale and Westcott (20th edition) under the heading of "MacLean's powder," is given as bismuth carbonate 2, sodium bicarbonate 1, magnesium carbonate (heavy) 2. The dose recommended for the first week is stated to be one teaspoonful six or seven times daily, with a double dose last thing at night, and extra powder during the night if the patient wakes. Thus one ounce of the powder may be given in 24 hours. A second formula (hospital formula) is given as bismuth carbonate 1, sodium bicarbonate 3, magnesium carbonate (heavy) 3, and creta preparata 3. One ounce of the former is equivalent to 47 grammes of alkali reckoned in terms of sodium bicarbonate, and one ounce of the latter (hospital formula) is equivalent to 40·6 grammes of sodium bicarbonate.

In Dr. Oakley's seven cases one that was fatal took an average daily quantity of 22·5 grammes over a period of four days, and another 38·6 grammes of sodium bicarbonate daily for fourteen days. Of the four cases that survived alkalosis the smallest daily intake was 23·4 grammes and the largest 54·8 grammes of sodium bicarbonate. It would seem therefore that the dose of pulvis bismuthi compositus is dangerously large, and that particularly in patients who are anæmic or vomiting anything approaching the dosage recommended should be given with caution.

I wish also to draw attention to Dr. Oakley's observation that five of his seven cases were given alkali in powder form. As he remarks, this allows of the possibility of much larger doses of alkali being taken than prescribed, because of the variation in the size and filling of the spoon used for measuring the dose of powder. On account of the inaccuracy of dosage when alkalis are prescribed in powder form it has always been my practice, and for 15 years my teaching in the out-patient department at St. Bartholomew's Hospital, to prescribe alkali in solution. The prescription that I use contains bismuth carbonate grs. 15, sodium bicarbonate grs. 10, heavy magnesium carbonate grs. 7½. It is given six times in 24 hours. Dr. Oakley tells me that its equivalent in sodium bicarbonate is 13 grammes. This quantity of alkali is the maximum daily intake, and as such is less than two-thirds of the minimum quantity that caused alkalosis in Dr. Oakley's series. During a long experience of the use of this prescription no patient has developed alkalosis while taking it, and it is my opinion that this quantity of alkali, combined with other treatment on well-established lines, is adequate. Dr. Oakley's observations make it clear how greatly the dosage of alkali prescribed for this complaint varies in the different wards of even the same hospital.

I am, Sir, yours faithfully,

GEOFFREY EVANS.

Mansfield-street, W., August 22nd.

SIGNIFICANCE OF PERSISTENT HIGH BLOOD PRESSURE

To the Editor of THE LANCET

SIR,—I am much interested to hear from Dr. Wauchope that she finds no contra-indication to the giving of insulin to diabetics with persistent hypertension. I shall certainly follow her advice in suitable cases. My contention that arterio-sclerotic hypertensives stand insulin badly does not rest on an isolated case. In addition to the one I quoted, I can recall that of an arterio-sclerotic man of 80 with diabetes mellitus complicated by cataract and retinitis who was definitely made worse by even 5-unit doses of insulin twice daily, and several similar experiences have been quoted to me by other doctors. Dr. Lawrence, I believe, goes so far as to say that he regards insulin as a substance toxic to arterio-sclerotic vessels, and I have heard Dr. Charles Miller express a similar view.

It seems to me possible that these cases fall into two groups. First, those with diabetes mellitus who later develop essential hypertension; secondly, those with essential hypertension who subsequently develop glycosuria. I suggest that Dr. Wauchope's cases belong to the first group and mine to the second. Unless (or until) a marked degree of arterio-sclerosis develops, insulin, I agree, should do nothing but good to the former. The diabetes which arises secondary to essential hypertension is, in my experience, relatively mild and responds readily to dieting without the use of insulin. The diet need not be a strictly diabetic one but should aim at reducing the patient's weight. With Dr. Wauchope's remarks about hypoglycæmia I also agree.

I am, Sir, yours faithfully,

L. N. JACKSON.

Crediton, August 27th.

TISSUE EXTRACTS IN THE TREATMENT OF CANCER

To the Editor of THE LANCET

SIR,—I have continued my observations on the treatment of cancer with connective tissue extracts [1] and am able to record further good results obtained in inoperable cases. The hypothesis on which the treatment is based is, briefly, that carcinoma arises through failure of a factor which normally inhibits the overgrowth of cells. This inhibitory factor, it is suggested, is secreted by the connective tissue (whence it is discharged into the lymph) and acts most powerfully in the area where it is produced. Treatment is designed to bring this substance into contact with the cancerous cells, wherever they may be, by its intravenous injection; and any effect it may have should apply to secondary deposits just as much as to the primary growth. Experimental work published by Waterman [2] seemed to have a definite bearing on this theory, and since my report two years ago I have made a clinical trial of the tissue extract he described, subject to the modification that it was prepared from an area and an animal corresponding to that of the primary growth in the patient. The extract obtained, unlike that used previously,[1] is free from coagulable protein and relatively stable, and its active life seems to be about twelve weeks as compared with 7–10 days for the previous extracts.

A fellow worker having informed me of the results of some animal experiments he had carried out in an investigation of the value of iodine therapy in cancerous conditions, I made a clinical test of his preparation and found that it tended to relieve pain and to cause some recession of growth. As there was no antagonism between the two lines of treatment I have employed them in combination.*

With one exception all the 17 cases treated were patients in a public assistance hospital. They were all very severe and far beyond help from surgery or radium. The primary focus showed many variations. In no case was I responsible for the diagnosis, nor were the cases subject to any selection. In 6 cases the imminence of death prevented any hope that indications as to the value of treatment might be secured; of the remaining 11 none failed to show some benefit from treatment. Pain was constantly relieved, and 3 of these patients are now leading almost normal lives.

A group of 3, the only cases of prostatic carcinoma, produced perhaps the most remarkable improvement. They were all patients with suprapubic drainage, and none had passed water per urethram for some time, the periods being nine, five, and three months. In all of them normal micturition was secured by treatment. I regard the following case, admittedly the best, as very striking:—

The patient was a man of 80. In May, 1934, suprapubic drainage had been established for retention of urine due to a carcinoma of the prostate which was described as + +. In July, 1934, the condition had been explored and found to be quite inoperable; the growth had invaded the bladder and nothing was attempted. In January, 1935, he was referred to me for treatment. A daily intramuscular injection of iodine was given and gradually increased from 0·002 to 0·006 mg. Intravenous injections of prostatic extract (1–2 c.cm.) were given at intervals of four days. Within six weeks normal micturition was restored and became regular, and after a further month the suprapubic tube was removed. Three weeks later, early in April, the suprapubic wound healed. The patient was discharged from hospital in July, 1935, and was then reported as having no difficulty in micturition.

Great improvement was also secured in a case of universal rodent ulcer in a woman of 80, the lesions on the face being almost completely healed when treatment was brought to an end. The following case is another that deserves notice:—

Mrs. A., aged 47. Carcinoma of the cervix. She had first noticed a vaginal discharge in December, 1933. I first saw her in October, 1934. She had then been bedridden for fourteen weeks, complaining of severe pain, especially in the left leg, and a very offensive and profuse vaginal discharge. The bladder was distended, reaching nearly to the umbilicus, and per vaginam it was impossible to introduce one finger beyond the obstruction caused by the growth. The cervix could not be reached. Catheterisation yielded 14 oz. of urine plus a further 10 oz. of mucus on associated aspiration.

Treatment was with daily intramuscular injections of iodine up to a dosage of 0·004 mg. and with intravenous uterine extract up to 2·0 c.cm. at intervals of four days. After four weeks the pain and discharge were sufficiently diminished to allow of the patient's getting up. After a further six weeks the bladder was normal in size, pain was quite gone, discharge was negligible, and normal micturition was the rule. Per vaginam four fingers could be introduced and the cervix was readily felt.

Although it is believed—and this view is supported by clinical evidence—that the action of the inhibitory agent is more or less specific to its own area, it does not seem to be entirely inert elsewhere.

I have a patient with a large inoperable carcinoma, of uncertain origin, on the left side of the pelvis. As the primary focus was obscure she was treated with iodine 0·002 mg. intramuscularly each day and intravenous breast extract 1·0 c.cm. at weekly intervals. She had very severe and intractable pain. The abdomen was very tense and there was free fluid in it. She had œdema of both legs and was bedridden. A little œdema now persists in one leg. The patient is doing some gardening and leading an almost normal life. The other leg is quite normal and there is no ascites. Her pain is gone. It is interesting to note that her tumour is only slightly smaller, as checked by an independent consultant.

An important point emerges here however—namely, that the extract appears to exercise its inhibitory effect upon the blood-forming mechanism in some degree. To counteract this, liver cannot be used owing to its carcinogenic property, and accordingly hog's stomach was employed (as Ventriculin, in 10 g. doses daily by mouth) to combat any anæmia that might arise.

Dosage must be governed by the requirements of the particular case. In this series the optimum doses seemed to be up to 0·006 mg. of iodine intramuscularly and up to 2·5 c.cm. of the tissue extract intravenously. As the extract is practically protein-free the dose interval is not of paramount importance, but a period of 4–10 days between injections appeared to be suitable. Within the range of these doses no toxic effects need be apprehended.

I do not suggest that the cancerous condition treated by these means cannot possibly recur, but it should be possible to deal with a recurrence by the measures which were effective against the original tumour. Nor must it be thought that any precipitate claim is being entered as to cure. Amelioration is the rule if the case be not too far advanced. The two factors that militate against improvement seem to be anæmia and a large bulk of growth. It is for the latter reason that the hopeful aspect of treatment in cases of carcinoma of the prostate is emphasised, even though they be inoperable; for here a relatively small bulk of neoplasm will produce urgent symptoms. I am not as yet in a position to apportion the relative values of tissue extract and iodine in treatment.

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[1] Baker, H. S.: THE LANCET, 1933, ii., 643.

[2] Waterman, N., de Kromme, L., and Lemmens, J. F.: Untersuchungen über Cytolyse bei Krebs, Biochem. Zeits., 1929, ccv., 1.

* The preparations used can be obtained from Messrs. Research Products Ltd., of Henrietta-street, Strand, London, W.C.

I am, Sir, yours faithfully,
H. SEARLE BAKER.

Wimpole-street W., August 17th.

A FOREIGN BODY IN THE TONSIL

To the Editor of THE LANCET

SIR,—Four days ago I was asked to see a lady who complained of sore throat and thought she could see an ulcer on her left tonsil. On examining her I could see a grey-looking patch, covered with a little yellow exudation, in the upper pole of the left tonsil. It felt hard to the touch. With a pair of forceps I removed a small metallic mass the size of a pea and remarked "it looks like the stopping of a tooth." The patient then stated that in June she had lost a stopping and had been to her dentist, who laughingly had asked her if she had swallowed it. The case would appear to be worth recording for the following reasons: (1) That the stopping should have lodged in the tonsil and got buried in it. Presumably it must have happened while she was asleep. (2) That it should have remained there for over eight weeks. (3) That it should have caused so little local or general disturbance.

I am, Sir, yours faithfully,
W. JAMES SUSMAN.

Henley-on-Thames, August 24th.

PUBLIC HEALTH

Ministry of Health: a Jubilee Survey

THE sixteenth annual report[1] of the Ministry of Health, the last to be drawn up by Sir Arthur Robinson, follows the customary plan, with a special section dealing with public health services in London. In presenting it to the King the Minister, Sir Kingsley Wood, summarises the main developments during the last 25 years in regard to those services which now fall within his province. The creation in 1912 of the scheme of National Health Insurance takes pride of place, both chronologically and because of its importance. The vast expansion of the responsibilities of local authorities and the development of environmental health services (water-supply, housing, town-planning) and personal health services (tuberculosis, maternity and child welfare, general institutional provision, provision for the blind, mental treatment and mental deficiency) are then outlined. Paragraphs follow on public assistance, provision for postgraduate medical education, international health organisations, and advances in medical knowledge. In this connexion the Minister says that close and cordial relations must be maintained between his department and the Medical Research Council and also the medical staff of the public health service, "which has in the past played so great a part in the prevention of disease and must in the future also make a notable and increasing contribution to the general treatment of disease." Good relations, he adds, must also be maintained with the medical profession generally as the first line of defence against disease and disability. All will agree that the establishment and development of closer contacts between the State and the medical profession during the last 25 years are of good omen.

Deaths from Botulism in North London

At the final inquest held on August 23rd by the St. Pancras coroner, Mr. W. Bentley Purchase, the jury found that the three women died from botulism as the result of eating nut meat brawn, but that the man died from natural causes. He was the brother of one of the victims, and had eaten some of the same article of food, but Sir Bernard Spilsbury attributed his death to coronary artery disease. His death followed shortly after seeing his sister die in hospital. But there was, the coroner said, presumably a fourth death from botulism, that of a boy who partook of the same food in the house of one of the victims and had died later at his home outside London. Botulism was not at first suspected in his case, but after the autopsy it was regarded as the probable cause of death. The jury added a rider that under present regulations there was no neglect on the part of the manufacturers of the brawn. The coroner, endorsing this rider, remarked that in the future steps might have to be taken to avoid a recurrence. Dr. P. V. Pritchard, acting M.O.H. for St. Pancras, said that as far as the experimental evidence went it seemed that the infection came from an organism attached to some of the vegetables used in the brawn mixture, but which vegetable they had been unable to discover. For preparing this particular brawn peas and carrots had been freshly brought each morning from Covent Garden. It has been made for 29 years, and no previous case of botulism had been traced to it. In reply to a representative of the London Chamber of Commerce, Dr. Pritchard said he knew of no case of botulism which had occurred from food canned in this country or from canned food imported into this country from elsewhere. The deputy director of the Bristol food research station stated that botulism always existed as a danger, but could be combated by simple means which had been common knowledge in this country for at least twenty years. Britain produced from 150 to 200 million cans a year, and in reply to the coroner's question whether the *Bacillus botulinus* had ever successfully passed through the process and caused damage, he said there had been no instance in this country and none in America when those commercial processes had been carried out. All the British vegetable canners were, he said, using an absolutely safe process. Investigations by the Ministry of Health into the origin of the present cases are not yet completed.

Food Poisoning in East Lancashire

The number of cases of food poisoning reported in or near Nelson, Lancashire (see THE LANCET, July 20th, page 160), amounted in all to 174. Of the 7 deaths 3 occurred in Burnley and 4 in the Nelson area; 3 of the latter on July 4th, the fourth on July 22nd. In this case the illness began at the same time as in the other cases; after autopsy the cause of death was certified as toxic myocarditis attributable to food poisoning. Of the deaths in Burnley the first occurred on July 5th, and in this case there was direct evidence of the consumption of infected food in Nelson on July 1st. The second death occurred on July 16th in the Municipal Hospital, the patient having been removed there from the Nelson area. Bacteriological investigation following post-mortem examination showed *B. aertrycke* to be present, but a definite linking up of this case with the infected food was not established. The third death at Burnley (also in the Municipal Hospital) occurred on July 20th; this patient was removed to the hospital from Nelson and the history of his illness was coincident with the other cases of food poisoning in Nelson. In each of the last three fatal cases the medical evidence showed some preceding depression of health. In all seven a verdict of accidental death was returned.

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[1] H.M. Stationery Office. Pp. 350. 5s. 6d.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 24TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1553; diphtheria, 840; enteric fever, 61; acute pneumonia (primary or influenzal), 425; puerperal fever, 43; puerperal pyrexia, 134; cerebro-spinal fever, 13; acute poliomyelitis, 35; acute polio-encephalitis, 3; encephalitis lethargica, 7; dysentery, 21; ophthalmia neonatorum, 84. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 30th was 2525, which included: Scarlet fever, 730; diphtheria, 887; measles, 30; whooping-cough, 416; puerperal fever, 19 mothers (plus 4 babies); encephalitis lethargica, 270; poliomyelitis, 13. At St. Margaret's Hospital there were 23 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 4 (0) from measles, 5 (1) from scarlet fever, 22 (4) from whooping-cough, 19 (3) from diphtheria, 51 (12) from diarrhœa and enteritis under two years, and 9 (0) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa and enteritis were scattered over 26 great towns, the highest numbers being Hull and Liverpool each 4, Gateshead and Sunderland each 3, no other great town more than 2. Birmingham and Newport each reported 3 fatal cases of whooping-cough, Sunderland 2.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 41 per 1000 total births), including 29 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. A. G. Taylor to *President* for course; T. Madill to *Orion* as Squadron M.O.; and C. N. Ratcliffe to *Pembroke* for R.N. Hospital, Chatham.

Surg. Comdr. (Emergency List) G. H. S. Milln removed from Emergency List (non report).

Surg. Lt.-Comdr. M. Barton to be Surg. Comdr.

Surg. Lt.-Comdrs. G. Rorison to *Victory* for R.N.B., and J. Cussen to *Furious*.

Surg. Lts. W. J. M. Sadler to *St. Angelo* for R.N. Hospl., Malta; S. J. Wheeler to *President* for course; and G. S. Thoms to *Victory* for R.N.B.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. R. A. Condon and Surg. Lt. D. R. Hughes to *Victory*.

Proby. Surg. Lt. W. G. Campbell to be Surg. Lt.

Proby. Surg. Lts. (D.) A. C. Fuller and J. Bunyan to be Surg. Lts. (D).

F. J. S. Gowar entered as Proby Surg. Lt.

Proby Surg. Sub-Lt. S. E. Cooke to *Pembroke* for R.N. Hospital, Chatham.

Proby Surg. Sub-Lts. to be Surg. Sub-Lts.: J. B. W. Hayward, P. H. K. Gray, and W. H. Osborn.

ARMY MEDICAL SERVICES

Maj.-Gen. (Supern.) J. W. West, C.B., C.M.G., C.B.E., M.B., M.Ch., late R.A.M.C., having attained the age for retirement, is placed on ret. pay.

Lt.-Col. and Bt.-Col. J. M. Weddell, F.R.C.S., K.H.S., from R.A.M.C., to be Col.

R.A.M. Coll.—Maj.-Gen. (Supern.) J. W. West, C.B., C.M.G., C.B.E., M.B., M.Ch., late R.A.M.C., relinquishes the appt. of Professor of Mil. Surgery and Consulting Surg. to the Army.

Col. J. M. Weddell, F.R.C.S., K.H.S., late R.A.M.C., to be Professor of Mil. Surgery and Consulting Surg. to the Army.

ROYAL ARMY MEDICAL CORPS

Maj. T. O. Thompson to be Lt.-Col.

Maj. H. C. Godding, M.C., is restd. to the estabt.

Short Serv. Commissions.—Lt. (on prob.) D. N. Keys is restd. to the estabt.

SUPPLEMENTARY RESERVE OF OFFICERS

E. T. St. M. Brett to be Lt.

ARMY DENTAL CORPS

The undermentioned are granted temp. commissions in the rank of Lt.: J. H. Sherwen and C. W. Upton.

TERRITORIAL ARMY

Lts. F. S. M. Heggs and T. A. L. Davies to be Capts.

Supernumerary for service with the O.T.C.—Lt. R. W. Rattray resigns his commission.

W. I. C. Morris, M.B., F.R.C.S. Edin. (late Offr. Cadet C.Q.M.S., Edinburgh Univ. Contgt., Sen. Div., O.T.C.), to be Lt. for duty with the Med. Unit of that Contgt., July 2nd, 1935. (Substituted for the notification in the *Gazette* of July 19th, 1935.)

Capt. B. Reid resigns his commn.

TERRITORIAL ARMY RESERVE OF OFFICERS

Capt. F. H. Taylor, from Active List, to be Capt.

ROYAL AIR FORCE

Wing Comdrs. T. J. Thomas to R.A.F. Station, Calshot, for duty as Medical Officer.

Flight Lts. C. G. Harold to Medical Training Depôt, Halton, and G. O. Williams to Central Medical Establishment.

RESERVE OF AIR FORCE OFFICERS

L. V. McNabb is granted a commission as Flying Offr. in class DD.

INDIAN MEDICAL SERVICE

The undermentioned officers retire: Maj.-Gens. Sir R. McCarrison, Kt., C.I.E., K.H.P., and H. R. Nutt, M.D., F.R.C.S., K.H.S.

DEATHS IN THE SERVICES

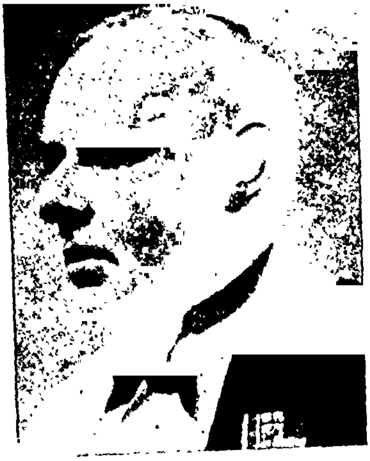
The death occurred on Sept. 1st of Lieut.-Col. James Dorgan, R.A.M.C. (retd.). He was born in County Cork and educated at Clongowes and Queen's College, Cork. He qualified as M.B. R.U.I. in 1898 and entered the R.A.M.C. two years later, becoming major in 1912 when he was stationed at Hong-Kong. He had taken the diplomas of D.P.H. and D.T.M. and early in the war had to deal with a large epidemic of cerebro-spinal fever which gave him the opportunity of investigating the carrier problem. This work was published in our columns (THE LANCET, 1919, ii., 97) when Lieut.-Colonel Dorgan was studying carrier problems in Mesopotamia. His death occurred at Southport where he was living in retirement.

ISOLATION HOSPITALS.—Cheshire county council has prepared a scheme to take over the isolation hospitals in the county which is to be divided into six areas for one hospital. The hospitals would be controlled by a standing committee composed of two-thirds of members of the county council and one-third members of local authorities.

OBITUARY

HUGH WILLIAM ACTON, C.I.E., M.R.C.S. Eng.

THE death of Colonel Acton, briefly announced in our columns last week, deprives the Indian Medical Service of one of its ornaments and tropical medicine of an earnest and successful investigator. It was said of him that he had the ability to look further through a brick wall than anyone else.



[Photograph by Valentine

COLONEL ACTON

Hugh William Acton was born in 1883 in Calcutta where his father owned the Caledonian printing press. He was sent to England for his education, studying medicine at the Middlesex Hospital from which he qualified in 1905. He was house physician there and clinical assistant at the Chelsea Hospital for Women before entering the Indian Medical Service, which he did in July, 1907. He was sent to the frontier to assist Captain J. Woods as medical officer of the 53rd Sikhs at Peshawar, but in 1910 he was given work more congenial to his temperament, becoming assistant director of the Pasteur Institute at Kasauli, then the principal centre for antirabic treatment in India. Still nominally in military employ he was sent to Mesopotamia in May, 1916, and on his release with the rank of major in 1921 he was appointed to the chair of tropical pathology and bacteriology in the newly founded school of tropical medicine at Calcutta. It was then that was revealed the versatility of the man, for during the next 12 years e occupied the chair of helminthology, took charge the department of dermatology, was director of e school for the larger part of the time, and throughout in charge of beds at the Carmichael Hospital. When invalided home from India two years ago it was hoped that he would soon return, but these hopes were disappointed.

The recent annual report by his deputy bears witness to Acton's ability as teacher and demonstrator. He had the gift of clear and precise exposition, with the touch of dogmatism desirable in the instruction of undergraduates, but always with a readiness to give chapter and verse for novel and stimulating views. He was an ideal administrator, knowing from inside what was to be expected from the various departments of the school, and in medical research he had few contemporary rivals. His ability to grasp the essentials of a problem, to map out the lines of investigation, and to coördinate the results were combined with a lively and inquiring mind. His work with Curjel and Dewey on the treatment of tertian fever when in charge of the malarial research laboratory at Dagshai was the first serious work on the action of cinchona alkaloids on malarial parasites, and was followed by further work at the National Institute of Medical Research in which he showed the relation in these alkaloids of chemical formula to optical and therapeutic activity. He demonstrated for instance that the efficacy of cinchona febrifuge depended on the presence of quinidine, and he was successful in tracking down the cause of the toxic effects when quinine is administered intravenously and intramuscularly. His book on the dysenteries of India (1928), written jointly with R. Knowles, sets out advances made in handling these plagues during and since the war. The study filled a real gap, for dysentery has not as yet been the subject of a research expedition such as those organised against kala-azar and plague. More recently his theory of entamœba carriers led to a lively discussion at the Royal Society of Tropical Medicine; Acton held the view that there were two classes of carriers, one with lesions and one without, the former common in India and the tropics, the latter in the temperate zone. This is only to mention a few directions in which his investigations gave practical results; they also covered snake venom, lathyrism, epidemic dropsy, and many aspects of protozoology. His legacy to the school of a department of *mycology* is a reminder of how Acton helped to introduce *order* into one of the most confused subjects *in tropical* medicine.

Sir John Megaw writes: "From the outset Acton's interests lay chiefly in research and at an early stage in his career he collaborated with Colonel Knowles in a brilliant piece of work on snakes and snake venom. This investigation was only the beginning of a long and happy association between Acton and Knowles who remained firm friends as well as colleagues during their long stay at the Calcutta school. Acton's numerous publications testify to his ability as a versatile and original worker, but they do not by any means tell the whole story of his influence on medical research in India. Acton's brain was remarkably prolific in ideas, but most of these were communicated to his colleagues and assistants—to the great benefit of their research work. He was a natural leader of men, and commanded the admiration of his associates to such an extent that their unquestioning acceptance of his views was almost a handicap in his work. His premature death is a heavy blow to his former colleagues and assistants as well as to a large circle of other personal friends."

Colonel Acton married in 1911 May Louise Jacobs and leaves a widow and two sons, one of whom is a medical student.

GEORGE HERBERT MORRISON, M.B. Edin.

Dr. G. H. Morrison, whose death from injuries on August 23rd we annc unced last week, was elder son of the late G. H. Morrison, sometime moderator of the United Free Church of Scotland, and was born in Glasgow in 1898. He received his early education at Glasgow Academy, and as on a cycling tour in Germany when war broke out in August, 1914. He was able *to* reach fri nds in Mecklenburg-Schwerin, at whose house had acted as tutor during the summer vacation, an after the internment regulations came *into force* he w s sent *to* the civilian camp at Ruhleben. There he remained until January, 1918, when after a serious illness he was exchanged and sent home. He was thus 20 ears old when he began to study medicine at Edinburgh University, where his ability and wit made notable as a debater at the *Royal* Medical Societ *and* as editor of the *Student*, the undergraduate weekly. On qualifying in 1923 he joined the editorial staff of THE LANCET for two years; then for a time he returned to clinical work, gaining experience by resident posts at the National Temperance Hospital, and as clinical assistant at the Royal Edinburgh Mental Hospital. After a period of general practice he was appointed medical adviser to Bayer Products Ltd. and editor of "Clinical Excerpts," and in these capacities did much to bring the results of German medical and pharmacological research before the medical profession in this country. Morrison was ready and successful in friendship, and among his wide acquaintance had a well-deserved reputation as a maker of pungent and amusing phrases. His verses were published in *Country Life* and elsewhere, and he was the founder of the King James VI. Society, a flourishing dining-club of Scottish university men. He leaves a widow and a young son.

ANDREW FULLER, L.R.C.P. Edin.

Dr. Andrew Fuller, who died at Perranporth, Cornwall, at the age of 76, was for many years medical inspector for poor-law services under the Local Government Board and Ministry of Health. Born at Codsall in 1859, the son of William M. Fuller, one of the organisers of the Y.M.C.A., Andrew Fuller was educated at Wolverhampton Grammar School and Birmingham University, taking his medical course partly at Queen's College and partly at Edinburgh, from which he qualified in 1882. He was then resident medical assistant at the General Hospital, Birmingham, before entering general practice at Bugbrooke, Northants, which he gave up in 1893 to accept the post at the Local Government Board. Here he was in charge of the care, feeding, and training of pauper children, and of the provision of trained nursing staff for the poor-law service. He was responsible for many improvements in dietary and initiated the systematic medical examination of children in the poor-law schools. He was one of the principal witnesses before the Royal Commission (1909) on the Poor Law, and was associated with Morant in an abortive scheme for coördinating the voluntary and poor-law hospitals. In large measure he deserves credit for the improvement in the character of the hospitals before they became municipalised. During the war Dr. Fuller examined for compensation the victims of air raids, and just before his retirement he was examining the blind for the Home Office. On leaving the public service in 1921 he bought a practice at Perranporth, in which he was joined by Dr. Andrew R. Fuller. Dr. Fuller married Emily Beatrice Lois, daughter of Charles Berry. Another of their sons is Dr. C. B. S. Fuller of Winchester. Mrs. Fuller is a justice of the peace for Cornwall.

Dr. SEAN O'DEA, who died on August 27th, was county medical officer of health for Donegal. A native of County Clare, he qualified M.B. N.U.I. in 1923, and served for a time as a medical officer in the army of the Irish Free State. After taking the D.P.H. in 1926 he spent some time at public health work in England, and five years ago was appointed the first medical officer for Donegal. He had much pioneer work to undertake, but succeeded in laying the foundations of a sound administrative system. In October last he married Dr. Attracta Halpenny, pathologist to the Richmond Hospital, Dublin, and much sympathy is felt for her by a large circle of friends.

MEDICAL NEWS

Society of Apothecaries of London

At recent examinations the following candidates were successful :—

Surgery.—H. N. Davis, Univ. of Oxf. and St. Bart.'s Hosp. ; H. Firman, Univ. of Manch. ; N. R. James, London Hosp. ; E. E. Le Feuvre, St. Mary's Hosp. ; R. A. McMillan, Middlesex Hosp. ; F. R. Neubert, Univ. of Liverp. ; S. E. Osborne, Guy's Hosp. ; and J. E. G. Wright, Queen's, Univ. of Belf., and Westminster Hosp.

Medicine.—E. L. Burgess, King's Coll. Hosp. ; J. A. Carter, Univ. of Camb. and London Hosp. ; E. M. Craggs, Middlesex Hosp. ; H. Firman, Univ. of Manch. ; R. G. Joyce, Welsh National School of Medicine ; H. N. Levitt, Guy's Hosp. ; and F. R. Neubert, Univ. of Liverp.

Forensic Medicine.—E. M. Craggs, Middlesex Hosp. ; H. Firman, Univ. of Manch. ; H. W. John, St. Mary's Hosp. ; and F. R. Neubert, Univ. of Liverp.

Midwifery.—H. N. Davis, Univ. of Oxf. and St. Bart.'s Hosp. ; J. E. Garson, Univ. of Madras and West London Hosp. ; A. Morgan, Univ. of Manch. ; M. A. Partridge, Guy's Hosp. ; and S. Roberts, Univ. of Bristol.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery : E. L. Burgess, J. A. Carter, H. N. Davis, J. E. Garson, R. G. Joyce, H. N. Levitt, S. E. Osborne, S. Roberts, and J. E. G. Wright.

University of Glasgow

Dr. Duncan Blair, professor of anatomy and dean of the medical school at King's College, University of London, has been appointed regius professor of anatomy in the University in succession to Prof. T. H. Bryce, who has resigned.

Duncan MacCallum Blair was born in 1896 and educated at Woodside School, Glasgow, and Glasgow University. From 1915 to 1917 he broke into his medical studies to serve as surgeon sub-lieutenant with the R.N.V.R. and returned to Glasgow to graduate M.B. with honours in 1919. In the same year he became demonstrator of anatomy in the University, later proceeding to London, where he held the John Hunter lectureship in applied anatomy at St. George's Hospital medical school until 1927, when he was appointed to his present post. In 1923 Dr. Blair was awarded the Symington prize. He is the author of the section on arthrology in the 6th edition of Cunningham's Text-book of Anatomy, and has of recent years devoted much attention to the study of neurohistology by means of infra-red photography.

University of Birmingham

In connexion with the opening of the session in October, it has been arranged to hold a series of post-graduate lectures at the General, Queen's, and Children's Hospitals, for old students of the school on Friday and Saturday, Oct. 11th and 12th. Sir Walter Langdon-Brown will give an address on Friday in the medical theatre, Edmund-street, and the annual dinner will be held at the Grand Hotel at 8.15 on the same evening. Further particulars may be had on application to the dean.

London School of Dermatology

The Chesterfield lectures, which constitute a systematic course in dermatology, will be given at 5 P.M. during October and November, and January and February. An examination will be held at the end of the course in March and the Chesterfield medal will be awarded. There will be out-patient clinics daily. Medical practitioners will be welcome as occasional visitors on presentation of their cards. Further particulars may be had from the dean of the school, St. John's Hospital for Diseases of the Skin, Leicester-square, London, W.C.2.

Auxiliary Courses for D.P.H.

A three months' course of lectures and demonstrations on clinical practice and in hospital administration for candidates for the D.P.H. will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W., by Dr. A. Joe, the medical superintendent, on Mondays and Wednesdays at 9.30 A.M. and alternate Saturdays at a time to be arranged, beginning on Monday, Sept. 30th. A similar course will be given at the Brook Hospital, Shooter's Hill, Woolwich, S.E., at the same times by Dr. J. V. Armstrong, the medical superintendent, beginning on Monday, Oct. 7th. Applications should be made to the medical officer of health, London County Council, Public Health Department (Special Hospitals), The County Hall, S.E.1.

Dr. A. M. W. Rae, senior medical officer, has been appointed a member of the executive council of the Gambia and an official member of the legislative council.

Dr. H. Harold Scott, assistant director of the Bureau of Hygiene and Tropical Disease, has been appointed director in succession to Sir Arthur Bagshawe, who has retired.

Typhoid Fever in Belfast

The public health committee of Belfast was summoned at the week-end to consider an outbreak of typhoid fever in the Greencastle area of the city. Forty-one cases have been reported, and it is believed that the epidemic is caused by milk, most of the cases having occurred on a particular milk round.

Coventry and Warwickshire Hospital

The board of management of this hospital has decided to begin at once with the first two sections of their extension scheme at an estimated cost of £86,000. This will provide for 69 and 54 beds for patients and 69 beds for nurses.

Hospitals in Newcastle

The Newcastle-upon-Tyne corporation has undertaken to spend £70,000 on extensions to the hospitals under its jurisdiction. Some institutions in the city are full to overflowing, while others have difficulty in filling beds. It has been suggested that a number of the smaller hospitals should be closed and a large new hospital erected.

C.S.M.M.G. Congress

Several medical men are to address the members' congress of the Chartered Society of Massage and Medical Gymnastics to be held at Harrogate from Sept. 18th to 21st. Dr. W. Edgecombe will speak on the Spa Treatment of Rheumatism, Mr. R. Broomhead, F.R.C.S., will give a lantern lecture on Some American Orthopædic Clinics, Dr. F. W. Eurich will speak on Functional Disorders and Malingering, Dr. W. H. Maxwell Telling on Some Points in the Diagnosis and Treatment of Fibrositis, Dr. W. J. Turrell on Short Wave Therapy, Mr. C. Gordon Erwin will give a lantern lecture on Bone Regeneration, and Mr. Basil Hughes will speak on Surgical Developments in connexion with the Sympathetic Nervous System. The founders' lecture will be delivered by Prof. H. H. Woollard, M.D., on Nerves and Vessels of the Skin. All the lectures will be given in the spa rooms, and the annual dinner will be held at the Grand Hotel on the Friday evening.

Fellowship of Medicine and Post-Graduate Medical Association

A post-graduate course in medicine and surgery for men only will be held at the Westminster Hospital from Sept. 16th to 28th. Other courses during September include a course in chest diseases at the Brompton Hospital (Sept. 23rd to 28th); a special M.R.C.P. class at the Brompton Hospital (twice weekly at 5 P.M., from Sept. 10th to Oct. 4th); a week-end course in ophthalmology at the Royal Westminster Ophthalmic Hospital (Sept. 28th and 29th); a course in proctology at the Gordon Hospital (Sept. 30th to Oct. 5th); evening clinical and pathological class for M.R.C.P. candidates at the National Temperance Hospital (Tuesdays and Thursdays at 8 P.M., Sept. 10th to 26th); and a course on the interpretation of X rays at the Medical Society of London lecture room (Sept. 30th to Oct. 4th, at 5 P.M.). Further courses to be given are dermatology at St. John's Hospital (Sept. 30th to Oct. 31st, afternoons); anatomy and physiology at the Infants Hospital (Mondays, Wednesdays, and Fridays at 8 P.M., from Oct. 7th to Nov. 29th); endocrinology at the National Temperance Hospital (Tuesdays and Thursdays at 8.30 P.M., Oct. 8th to 24th); gynæcology at the Medical Society of London (4 P.M. once weekly, Oct. 10th to Nov. 7th); and fevers at the Park Hospital (Oct. 5th and 6th). Detailed syllabuses can be obtained from the secretary of the Fellowship, 1, Wimpole-street, W. 1. Courses are open only to members.

Out-patients at Ipswich

The East Suffolk and Ipswich Hospital is to have its out-patients' department extended, and an attempt is being made to eliminate the attendance of chronic cases. It is hoped that the development of the appointment system will prevent much waste of time. This system has already been started in the casualty department where each patient is handed a card for subsequent attendances. During an experimental period no patient has had to wait longer than ten minutes.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDIC[illegible] 1, Wimpole-street, W.

MON. [illegible] Sept. 14th.—INFANTS [illegible] .W. Afternoon post-graduate course in infants' diseases.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues. and Thurs., 8 P.M.: Clinical and pathological class.—ROYAL CHEST HOSPITAL, City-road, E.C. Mon., Wed., and Fri., 8 P.M.: Class in heart and lung diseases.

SOCIETIES

PADDINGTON MEDICAL SOCIETY.

TUESDAY, Sept. 10th.—9 P.M. (Great Western Royal Hotel, Paddington), Mr. A. Dickson Wright: Sclerosing Injection Treatment in General Practice.

Appointments

JOHNSON, P. DUNBAR, M.R.C.S. Eng., has been appointed Hon. Anæsthetist to the Buchanan Hospital, St. Leonards-on-Sea.

LANYON, C. B., M.D. Lond., Senior Resident Medical Officer at the Queen's Hospital for Children, London.

SLOT, GERALD, M.D., M.R.C.P. Lond., D.P.H., Hon. Physician to the Buchanan Hospital, St. Leonards-on-Sea.

Medical Referee under the Workmen's Compensation Act, 1925: JAMES LAW FALCONER, M.B., F.R.C.S., of Bolton, for Bolton (Circuit No. 5) and Wigan (Circuit No. 6) County Court Districts.

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On August 26th, at Glasgow, the wife of Frank E. Anderson, M.B. St. And., Sudan Medical Service, of a son.

BLAUVELT.—On August 24th, at Neville-street, S.W., the wife of Hugh O. Blauvelt, F.R.C.S. Eng., of a daughter.

COLES.—On August [illegible] W., the wife of Bennett Coles, [illegible] of a son.

EVERETT.—On Aug[illegible] the wife of A. D. Everett, F.R.C.S. Eng., of a son.

PAUL.—On August 28th, at Welbeck-street, W., the wife of Saville Paul, M.R.C.S. Eng., of Kingsbury, N.W., of a daughter.

WELDON.—On August 23rd, at a nursing-home, Wexford, the wife of Surg.-Lt. Comdr. S. G. Weldon, M.B. Dub., Royal Navy, of a son.

WILLIAMSON.—On August 27th, at Hythe, the wife of S. T. Williamson, M.R.C.S. Eng., of a daughter.

MARRIAGES

TURNE[illegible]—On August 28th, at St. Augustine's, Ki[illegible] gman Turner, M.R.C.S. Eng., to [illegible] Mr. and Mrs. Arthur Couldrey of Bloomsbury.

DEATHS

MACDONALD.—On August 25th, Alderman George Godfrey Macdonald, M.D. Glasg., J.P., at Crich, near Matlock, aged 74.

MORTON.—On August 26th, at a nursing-home, Shadforth [illegible] M.D. Durh., M.R.C.S. Eng., of Henfield, Sussex [illegible] physician, Croydon General Hospital.

REID.—On Sept. 1st, at St. Helens, James Reid, M.B. Edin.

TAGGART.—On August 29th, 1935, following an accident at her residence "Peel Moat House," Heaton Moor, Stockport, Alice Emily, the dearly loved wife of Dr. J. Scott Taggart, aged 62 years.

WILLS.—On Sept. 1st, at Canterbury, Reginald Graham Wills, M.D. Aberd., aged 71.

WORRALL.—On August 25th, Edward S. Worrall, M.R.C.S. Eng., of Crouch Hill, N.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE MEASUREMENT OF ULTRA-VIOLET RADIATION IN DAYLIGHT

By J. S. Owens, M.D., A.M.I.C.E.

SUPERINTENDENT OF OBSERVATIONS ON ATMOSPHERIC POLLUTION, DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

The growing appreciation by physiologists of the value of ultra-violet radiation and the need for some simple means of measurement has prompted me to devise the apparatus described below. The principle upon which it is based has been tried before in different forms, and usually involves the use of an optical wedge. This admits light to a sensitised paper above which is an opaque plate having a row of small holes, and the amount of light reaching the paper through these holes is graduated by the superimposed wedge or its equivalent. We should thus get, with a bright illumination, a greater number of spots on the paper than with a faint illumination, and the number of spots becomes a measure of the amount of light falling on the apparatus. There are, however, serious difficulties in finding an optical wedge suited for use with ultra-violet light, and several methods which have been tried have failed owing to this. A gelatin wedge could be made which would fulfil the purpose, but unfortunately it is not permanent and varies in its transmission with humidity and so on, while it is not easy to make a number of wedges exactly similar.

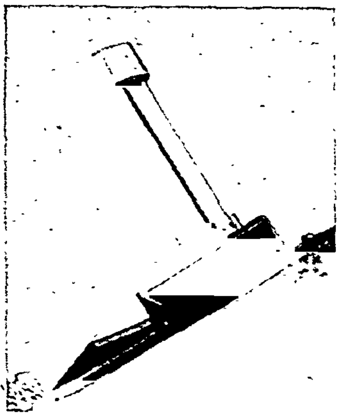


FIG. 1.—Apparatus mounted at an angle of 45°.

THE APPARATUS

The apparatus now described consists of a series of tubes, about ½ in. bore and 6 in. long. These are dead black inside and are arranged in a series of concentric circles. The tubes terminate at the bottom in a plate having a small hole about 3/16 in. diameter in the axis of each. All these holes are the same diameter, and an arrangement similar to an ordinary printing frame permits a piece of sensitised paper to be held close against this perforated plate. The upper ends of these tubes or cells terminate in 13 holes of different diameter, ranging from about 10 mm. down to 0·7 mm.—i.e., from 200 to 1 in area. Over these is placed a piece of ultra-violet glass, such as Chance's No. 14, which transmits nearly all the ultra-violet rays between 3000 and 4000 A.U.

When this apparatus is exposed to daylight, the sensitised paper at the bottom of each cell receives an amount of light which is proportional to the area of the top hole, since all the tubes or cells are the same length. The light received is also inversely proportional to the square of the height of the cell, but this does not affect the present description, since the cells are all the same height. It provides, however, a useful means of adjusting the dimensions, so that the scale of sensitiveness may cover all probable conditions. It is known that the ultra-violet light which reaches the earth is not much, if anything, under 3000 A.U. owing to absorption by the atmosphere, hence there is no advantage in attempting to record wave-lengths below this. The apparatus may be mounted in a vertical position, pointing at the zenith; in this country it does not receive direct sunlight in this position. It is probably better, however, to mount it at an angle of 45° pointing north, as shown in Fig. 1, when comparable results for any country could be obtained.

It is designed for a whole day's exposure, and the scale is such that the brightest and longest day just gives a visible spot under the smallest hole, or perhaps the second smallest hole, while the darkest and shortest day gives a spot under the largest or some smaller hole. After exposure for 24 hours the number of visible spots is noted, not their intensity or darkness, and this number, referred to a scale, gives a measure of the intensity of ultra-violet radiation from the sky.

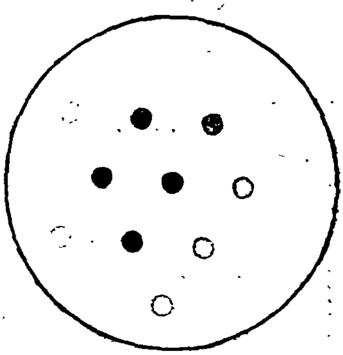


FIG. 2.—Sample record.

A = Cell number. B = Diameter of opening in mm. C = Scale reading based on cell showing just visible spot (paper not fixed).

A	B	C
1	10	1·00
2	9	1·23
3	8	1·56
4	7	2·04
5	6	2·78
6	5	4·00
7	4	6·25
8	3	11·10
9	2·5	16·00
10	2	25·00
11	1·4	51·00
12	1	100·00
13	0·7	204·00

The unit is an arbitrary one—i.e., the amount of ultra-violet light required to give a just visible spot under the cell having the largest top opening. We have, in effect, an optical wedge without any material wedge to vary, the quantity of light received being determined by dimensions alone. No calibration is required, and hence it is easy to make a number of instruments exactly similar. This is important when the instrument is used to compare the amount of ultra-violet radiation received at different places—e.g., in the centre of a smoky city and at the seaside.

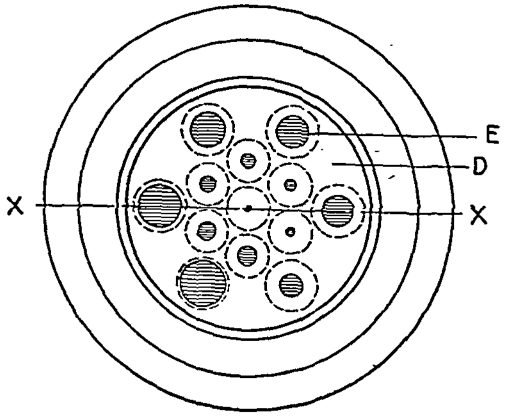


FIG. 3.—General construction of a shorter model: plan with the glass removed.

The sort of record obtained from the instrument is shown in Fig. 2 in which there are 10 spots visible. Reference to the Table gives the amount of ultra-violet radiation as 25. The sensitised paper used is Kodak Kodatone, and I find it preferable to read the record without fixing, which introduces a complication owing to fading, so that the amount of light recorded is only about one-third of that before fixing.

Figs. 3, 4, and 5 show the general construction of the apparatus, but the model is a shorter one than that shown in Fig. 1, and the scale and unit are different. It was found to be too sensitive, hence the length of cells was increased. This shows the simple way in which the sensitivity can be adjusted when fixing the most suitable range for a standard instrument.

THE THEORETICAL BASIS

The basic assumptions in this apparatus are that a paper of sufficiently uniform sensitiveness can be obtained, and that the effect of ultra-violet radiation upon this paper is in proportion to the intensity multiplied by the time of exposure. This last requirement involved checking the effect of what is known by photographers as "reciprocity," or proving that the effect of a uniform light was proportional to the time of exposure. Experiments showed that such an assumption might be made without introducing any important error.

The principle may be summarised in a few words thus. If the sensitised paper requires a definite amount of light to produce a just visible spot, it follows that for the same exposure to different light intensities the area of hole admitting light to the cell under which a just visible spot appears will be inversely as the illumination. Conversely, and since we wish to measure the intensity of the illumination, if we know the area of hole under which a just visible spot appears, after standard exposure, the intensity of illumination will be inversely as the area of this hole. For example, if in one case there is just enough light to make a visible spot under a hole of 50 units area, while in another there is enough to make a spot under a hole of 25 units area, the intensity in the latter case will be double that in the former.

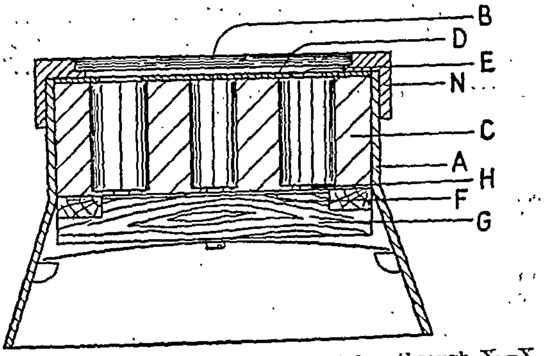


FIG. 4.—Vertical section of the same, taken through X—X in Fig. 3.

A, outer case; B, ultra-violet glass; C, block in which cells are formed; D, top plate showing holes of different diameter; E, hole in top plate over a cell; F, recess for sensitised paper; G, removable pad, as in printing frame; H, hole at bottom of a cell; N, cap for holding ultra-violet glass.

The instrument itself is robust and weatherproof and can be left out in all conditions of weather, the record paper being changed and read each day. It was felt desirable to exclude the effect of direct sunlight and aim at measuring skylight only. Any attempt to include light from the whole sky is subject to the drawback that the result would be governed partly by the area of sky visible from the point of exposure; such an apparatus could not be used amongst buildings where much of the sky is cut off. Experiments made to bring out this point showed that near an obstacle such as a house the light received under an opal dome fell off rapidly. For example, at 10 ft. from a house the reading was 12·5 units, while at 40 ft. it was 17·5. Similarly, near a tree, the reading was 28 units at 10 ft. away, while at 20 ft. it was 37, and at 50 ft. 42. These units are candle power received on the photoelectric cell of a Holophane Edgcumbe auto-photometer, placed under an opal bowl 17 cm. in diameter.

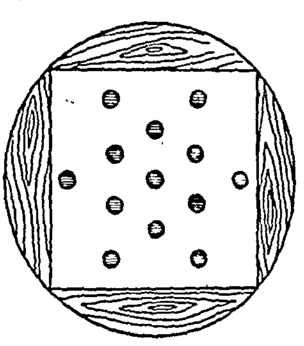


FIG. 5.—Bottom view of block C showing holes H and recess F.

Direct sunlight can be included, if desired, in an instrument exposed to the zenith, by using a diffusing or ground surface on the ultra-violet glass. This will not of course give the whole of the sunshine, but only a fixed proportion. Similarly, a certain amount is lost by reflection from the glass surfaces, but if the proportion so lost is constant for all instruments, it would not affect comparative figures and would be taken account of in any calibration made to find the absolute value of the unit of the apparatus. Such a complication however seemed unnecessary, an arbitrary unit being just as good as an absolute one for the purpose in hand.

An interesting anomaly indicated by observations with this instrument is that the ultra-violet radiation received from the sky is often actually increased by the presence of clouds, which catch and reflect the light from the sun.

RICHARD LOWER AND JOHN MAYOW

Dr. J. F. Fulton, Sterling professor of physiology in the School of Medicine of Yale University, has compiled, with pertinent and learned comment, bibliographies of the writings of the two famous Oxford physiologists, Richard Lower and John Mayow, who flourished in the latter half of the seventeenth century. The work reaches us as a reprint from the proceedings of the Oxford Bibliographical Society, and Dr. Fulton, who has already published through the same medium a bibliography of the works of Robert Boyle, promises to give the same valuable attention to Willis, Hooke, and others who played a prominent part in Oxford science during the Restoration. Oxford scholars and their contemporaries in the seventeenth century were greedy of knowledge, and it emerges from Dr. Fulton's studies that both Lower and Mayow were appreciated in their time, their work being discussed both during their lives and after they had died. Dr. Fulton finds, in accord with the view already expressed by Prof. T. S. Patterson of Glasgow, that Mayow was rather an enthusiastic student, summarising uncritical views held by others and contributing little himself, while Lower was an independent and painstaking investigator.

Lower is well known as the champion of the great Thomas Willis, whose assistant he was. But his treatise on the motion of the heart and the colour of the blood was an original work, as was his proof that the venous blood becomes red on passing through the lungs by virtue of being brought into contact with the air; this was the chief glory of his scientific career, though not his only contribution to learning. The treatise "De Corde" appeared in 1669, was published simultaneously in London and Amsterdam, and between its first issue and 1749 was reissued at least 12 times, while in 1932 it was republished at Oxford. To the second edition of "De Corde" there is an appendix on the origin of catarrh, and Dr. Fulton notes that the references in other literature to this work are usually to the form appended to the "De Corde," while there is evidence that several separate editions of the tractate were published. Lower's other well-known work entitled "Bromographia" is mainly an essay on the use of infusions of barley in medicine. This work appears also to have run through many editions, as issued from various continental, chiefly German, centres, but presumably met with no success in London. The bibliography closes with notes on the many references to Lower and his work occurring in scientific literature or in biographies, and adds an extraordinary elegy dedicated to him. They could certainly in the seventeenth century spread the adulation thickly, for the elegy closes as follows:—

> "And Reader, now wouldst thou his Equal know,
> Go follow him, for there's none left below;
> Go, follow to that Blessed Place Above,
> Where all your Admiration will be Love."

Mayow, whose name sounds the more familiar of the two, owes his fame to his "Tractatus Quinque" which was published after Lower had written "De Corde" and also after the famous experiments of Boyle, Hooke, and others on the respiration had appeared. There seems little doubt that much of Mayow's reputation has been due to the work of others. But Prof. Patterson, while allowing that much of the work on respiration attributed to Mayow was not original, still finds things in the "Tractatus Quinque" which had not been previously described. He points out that Mayow did in an ingenious manner show that what we call hydrogen and nitric oxide expand in the same kind of way as air: that is to say, obey Boyle's Law. And Dr. Fulton finds that Mayow cannot be adequately visualised unless one makes allowances for his youth. When still in his teens he was fired by the new scientific spirit which was abroad in Oxford, and he has left a creditable record of what was going on about him.

It is good to note the close and learned interest which is now being taken in the history of medicine, for undoubtedly the course of medical thought is often directed usefully by knowledge of the theories and exploits, successes and failures of past leaders.

A PILGRIMAGE TO MENTAL HOSPITALS

THIS story of a laywoman's pilgrimage through the mental hospitals of France, Belgium, and Holland[1] provides a useful sidelight on environmental conditions. In the mental hospitals of Belgium visited, most of which are connected with religious nursing orders, Miss Hankin was particularly impressed by the devotion of the nursing sisters and by the attitude of friendliness and affection obtaining between patients and nurses. She noted that confession appeared to play a valuable part as a means of psychotherapy and that many of the priests were trained in human psychology. In Holland, a Lutheran country, where much of the nursing is done by deaconesses, she was also favourably impressed and in both countries, with the notable exception of one institution, she finds much to praise in the hospital conditions. In France, on the other hand, she found both the nursing and the facilities for occupying the patients and developing their individual interests far less satisfactory. It would clearly be unfair to judge of the conditions in any of the three countries from such a brief and limited investigation. It is, however, of interest to observe that Miss Hankin, who has nursed in mental hospitals in England, although not in recent years, notes differences in the attitude adopted to the patients by the nurses, in the provision of suitable occupation, and in the prevalence of red tape. In these respects the foreign hospitals appear to score. In two of the hospitals visited a recovery-rate of 60 per cent. is claimed; whereas in this country this rate is generally considered not to exceed 35 per cent. It would be interesting to know to what extent the figures were based on similar classifications. Miss Hankin was particularly impressed by the colony at Gheel and her regret that we have no parallel in this country is shared by many. She notes also that in certain hospitals where the best results are claimed there is a very high proportion of both nurses and doctors to patients.

NEW PREPARATIONS

MANDELIC ACID (BOOTS).—We have received from Messrs. Boots Pure Drug Company Limited, Nottingham, a sample of their mandelic acid for use in the treatment of urinary infections. This is a crystalline powder readily soluble in water, alcohol, and ether, has a melting point of 118° to 120° C., and is represented by the formula CH(OH).COOH. Two years ago (THE LANCET, 1933, i., 855) Mr. A. T. Fuller, Ph.D., described work performed at the Bernhard Baron Memorial Research Laboratories, Queen Charlotte's Hospital, on the ketogenic diet and the nature of the bactericidal agent concerned. The present use of mandelic acid in the treatment of chronic infections of the urinary tract follows this work of Dr. Fuller and that of Dr. M. L. Rosenheim (THE LANCET, 1935, i., 1032) who found mandelic acid to be a valuable agent in cases of urinary infection unassociated with urinary obstruction. Since Dr. Rosenheim's article appeared Messrs. Boots have received medical evidence from several sources confirming the findings disclosed in Dr. Rosenheim's paper, the urine of the patients being rendered sterile and the improvement in conditions following in a satisfactory manner. It is admitted that for the present the treatment may have to be repeated on occasion, as in some cases it has been found that on discontinuance the urine becomes non-sterile, when the symptoms reappear. The dosage employed has been 12 g. of mandelic acid per day, and the fluid intake should be limited to two pints and the acidity of the urine increased by the administration of ammonium chloride. The standard mixture used in the treatment of cases at University College Hospital contains 3 g. of mandelic acid per ounce just neutralised by sodium bicarbonate and flavoured with lemon. One ounce of this mixture is given four times a day, while 8 cachets, each containing 1 g. of ammonium chloride, are also given during the day. A useful leaflet on the whole subject is supplied by the manufacturers, which includes the warning that careful supervision of the patient is required, lest the drug should act as a renal irritant. The preparation is non-toxic in therapeutic doses.

ERGOMETRINE.—The note published in THE LANCET on August 10th, 1935, p. 353, referring to this preparation is stated to give the impression that Messrs. Allen and Hanburys Ltd. issued ergometrine some time before the drug was issued by British Drug Houses Ltd. British Drug Houses Ltd. recall that on the publication of a paper which appeared in the *British Medical Journal* on March 16th, 1935, Ergometrine B.D.H. was placed upon the market. This fact was announced in a letter published in THE LANCET on April 13th, 1935, from Mr. C. A. Hill, managing director of British Drug Houses Ltd. British Drug Houses Ltd. find that the note under "New Preparations" of August 10th last gives the impression that not only were they not pioneers but were late in the field. In that note Mr. Hill's letter of April 13th ought to have been referred to.

THE MANUFACTURE OF RUBBER BULBS.—The manufacture of rubber bulbs is now meeting with a great variety of needs. In surgical work both thick-necked and thin-necked bulbs are required, for example, in different varieties of ear and nose spray. Nozzles assume different shapes and for convenience some of the bulbs may be made with a flat bottom. The length of the neck may also vary according to needs. We have received from Messrs. David

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[1] Doors of Hope. By Mabel Hankin. London: John Bale, Sons and Danielsson Ltd. 1935. Pp. 59. 2s. 6d

Moseley and Sons, Ltd., Ardwick, an interesting catalogue of the bulbs which they have on the market, and it may be noted that such a detail as the internal diameter of the neck can be arranged in accordance with requirements.

"THE LOCOMOTIVE GOD."—Miss Clara Leiser, 7, Park-avenue, New York City, writes that she is preparing an authorised biographical and critical study of Prof. William Ellery Leonard and his work. She hopes that psychologists, psychiatrists, or neurologists who have been in communication with him, have met him personally, or have definite opinions concerning his work—"The Locomotive God," published in America in 1927—will assist her and promises to return promptly anything that may be sent to her.

PROSTIGMIN AT REDUCED COST.—Attention has been called in our correspondence columns to the troublesome fact that the present price of this drug places it beyond the reach of the hospital class of patient except for short periods. Messrs. Hoffmann-La Roche inform us that Prostigmin is now available for the treatment of myasthenia cases in a more economical packing. This consists of 5 c.cm. rubber-capped phials of a concentrated solution, each cubic centimetre being equivalent to 2·5 mg. of prostigmin substance. 1 c.cm. of this concentrated solution is therefore equal in potency to 5 ordinary ampoules.

Vacancies

For further information refer to the advertisement columns

All Saints' Hospital for Genito-Urinary Diseases, Austral-street, S.E.—Res. H.S. At rate of £100.
Altrincham General Hospital.—Sen. H.S. At rate of £150.
Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. At rate of £150.
Bath Royal United Hospital.—H.S. At rate of £150.
Bedford County Hospital.—First H.S. At rate of £155.
Belfast, Forster Green Hospital for Consumption and Chest Diseases.—H.P. At rate of £150.
Birmingham, Dudley-road Hospital.—Jun. M.O. At rate of £200.
Hospital.—Asst. Ophth. Surgeon. £50.
rough.—Asst. M.O.H. £600.
Wandsworth Common, S.W.—Res. M.O.
Bradford Children's Hospital.—H.S. £100.
Bradford City.—Asst. School M.O. £500.
Brighton. New Sussex Hospital for Women, Windlesham-road.—H.S. £100.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.
Bristol [illegible] H.S. £100.
Bristol, [illegible] *'s Orthopædic Hospital and Sanatorium.*—[illegible]
Cancer Hospital, Fulham-road, S.W.—Asst. Radiologist. £350. Also H.S. At rate of £100.
Cheshire, East Lancashire Tuberculosis Colony, Barrowmore Hall.—H.P. At rate of £150.
Croydon General Hospital.—H.S. £125.
Croydon, Mayday Hospital.—Res. Asst. M.O. £350.
Derbyshire County Council.—Tuberculosis Officer. £750.
Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose and Throat Depts. £175.
Doncaster Royal Infirmary and Dispensary.—Sen. Res. £250. Also [illegible] At rate of £175.
Dreadno [illegible] *S.E.*—Med. Supt. £250.
Durham [illegible] Welfare M.O. £500.
Ealing Borough.—Asst. M.O.H. £600.
Enfield U.D.C.—Asst. M.O.H. and Asst. School M.O. £600.
Exeter, Royal Devon and Exeter Hospital.—H.P. Also H.S. to Ear, Nose, and Throat Dept. Each at rate of £150.
Fareham, Hants, Knowle Mental Hospital.—Jun. Asst. M.O. £350.
Gloucestershire Royal Infirmary.—H.P. At rate of £150.
Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. At rate of £200.
Golden-square Throat, Nose, and Ear Hospital, W.—H.S. £100.
Great Yarmouth [illegible] H.S. £140.
Guildford, Roya [illegible] -Res. Surg. O. £250. Also H.P. [illegible]
Hampstead Gen [illegible] *pital, Haverstock Hill, N.W.*—Cas [illegible] pt. At rate of £100.
Hastings, Roy [illegible] —Hon. Anæsthetist. Also Locum H.S. £5 5s. per week.
Herefordshire General Hospital.—H.P., also H.S. and Cas. O. Each at rate of £100.
Hospital for Sick Children, Great Ormond-street, W.C.—Research Fellow for Morbid Anatomy. £500. Res. Med. Supt. £300. Asst. M.O. £300. Also Out-patient Med. Reg. £250.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.
Huddersfield Ro [illegible] £200.
Indian Medical [illegible]
Infants Hospita [illegible] *minster.*—H.P. At rate of £75.
Kincardine County.—Divisional M.O.H. £500.
King's College Hospital, S.E.—Registrar to Ear, Nose, and Throat Dept.
Leicestershire County Council.—Asst. County M.O.H. £700.
Liverpool County Borough.—Two Jun. Asst. School M.O.'s. Each £500.
Liverpool, County Mental Hospital, Rainhill.—First and Second Asst. M.O.'s. £700 and £650 respectively.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt. £200.
Liverpool Stanley Hospital.—H.S. At rate of £100.
L.C.C.—Consulting Dental Surgeon. £1200.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.
Maidstone, West Kent General Hospital.—Two H.S.'s. Also H.P. Each £150.
Manchester, Ancoats Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £100.
Manchester, Crumpsall Hospital and Institution.—Jun. Res. Asst. M.O. At rate of £200.
Manchester, St. Mary's Hospitals.—Res. Obstet. O. £175. Also two H.S.'s. Each at rate of £50.
Margate and District General Hospital.—Res. M.O. £150.
Middlesbrough, North Riding Infirmary.—Asst. Hon. Surgeon. Also Third H.S. £125.
New Zealand. University of Otago and Dunedin Hospital.—Sen. Res. M.O. £500.
Northampton General Hospital.—Hon. Obstet. Surgeon. H.S. H.S. to Ear, Nose and Throat Dept. Also Cas. O. Each at rate of £150.
Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.
Norwich, Norfolk and Norwich Hospital.—H.P. £120.
Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. Also Cas. O. Each at rate of £150.
Plymouth Education Committee.—Asst. School M.O. £500.
Plymouth, Prince of Wales's Hospital, Greenbank-road.—Res. Anæsthetist and H.S. to Spec. Depts. At rate of £120.
Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—H.S. and H.P. Each at rate of £110.
Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P. At rate of £125.
Princess Louise, Kensington, Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £100.
[illegible] *Maternity Hospital, Marylebone-road, N.W.*—[illegible] rate of £100. Res. Anæsthetist and [illegible] rate of £90. Asst. Res. M.O. At [illegible] Obstet. Surgeon to Out-patients, and [illegible] natal Dept.
[illegible] *Hospital.*—Res. H.P., Res. Cas. O., [illegible] Blagrave Branch Hospital. Each at [illegible]
[illegible] H.S. £150.
[illegible] *ic Hospital, Gt. Portland-street, W.*—[illegible] Country Branch). Each at rate of £150.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.
St. Leonards-on-Sea. [illegible] Anæsthetist.
St. Peter's Hospital for [illegible] *Covent Garden, W.C.*—H.S. At rate of [illegible]
St. Thomas's Hospital, S.E.—Surgeon. Also Surgeon to Out-patients.
Salford Royal Hospital.—H.P., two H.S.'s. Also Cas. H.S. Each at rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.
Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Asst. Cas. O. At rate of £120 and £80 respectively.
Sheffield Royal Infirmary.—Second Asst. Cas. O. At rate of £80.
Sidcup, Queen Mary's Hospital.—Asst. M.O. £350.
Southampton, Isolation Hospital and Sanatorium.—Jun. Res. M.O. £200.
[illegible] *Royal South Hants and Southampton Hospital.*—
[illegible] *pital.*—H.P. £120.
[illegible] *Hospital for Children.*—Res. Asst. M.O. At rate of £200.
University College Hospital, Gower-street, W.C.—Tuberculosis Officer. £300.
Wakefield, Menston Mental Hospital.—Fifth Asst. M.O. £350.
Warrington Infirmary and Dispensary.—Third Resident. At rate of £150.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Surgeon.
West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.
Westminster Hospital, Broad Sanctuary, S.W.—"Wander" Scholar. £250.
Wigan, Royal Albert Edward Infirmary.—H.S. At rate of £150.
Willesden General Hospital, [illegible] *N.W.*—Res. Officer. At rate of £100. Also [illegible] M.O. £500.
Wokingham, Berks, Pinewo [illegible] *ooler's Hill,*
Woolwich and District War [illegible] *S.E.*—Res. M.O. £175.
York Dispensary.—Res. M.O. £175.
Zetland County Council.—M.O. and Public Vaccinator. £80.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Sunderland (Durham) (latest date for receipt of applications Sept. 10th) and at Markinch (Fife) (applications before Sept. 17th).

ADDRESSES AND ORIGINAL ARTICLES

PERFORATION OF THE ŒSOPHAGUS BY SWALLOWED FOREIGN BODIES

BY JOHN E. G. MCGIBBON, M.B. Lond., D.L.O.
HON. LARYNGOLOGIST, ROYAL SOUTHERN HOSPITAL, LIVERPOOL

With Radiological Notes by

J. H. MATHER, B.Sc., M.B. Liverp., D.M.R.E.
HON. RADIOLOGIST TO THE HOSPITAL

WRITING in this journal last year Scott-Brown [1] drew attention to the frequency of perforations of the œsophagus by carcinoma, and there is no doubt that neoplasm is the most common cause of such lesions. Perforation by swallowed foreign bodies would probably rank second in frequency, although it is possible that many cases pass unrecognised, as the diagnosis is not always easy and spontaneous recovery may occur. Nevertheless, all such accidents are fraught with danger and any one may end in tragedy.

The three following cases have been observed recently.

CASE 1.—Female, aged 32. On Nov. 29th, 1932, while eating stewed rabbit, she thought a bone had stuck in her throat. She complained of dysphagia and pain on attempting to swallow, but on examination in hospital four hours later no abnormality was found. X ray examination showed a "hitch in passage of opaque paste middle-third of œsophagus—? foreign body in this region." Œsophagoscopy revealed no foreign body, but a small wound of the posterior œsophageal wall 8½ inches from the incisor teeth was visible. The presence of a perforation was not suspected, and the patient was discharged *next day still complaining* of pain on swallowing. The pain persisted after discharge, until she died unexpectedly a week later. Following her discharge from hospital she had been in the care of her *own* family doctor, who had observed no abnormal physical signs except a slightly irregularly elevated temperature. Autopsy showed a purulent infection of the entire retro-œsophageal and retro-pharnygeal spaces. No foreign body was found.

CASE 2.—Male, aged 26. After eating fish on June 17th, 1934, he felt a pain in his throat as if a bone were lodged there. He experienced pain but no difficulty on swallowing. He came to hospital on June 22nd when nothing abnormal was found on examination. X ray report was as follows: "This patient has a large accumulation of gas (air) in his mediastinum pointing to perforation of his pharynx or œsophagus. The upper portion of the œsophagus is displaced laterally. No 'hold-up' of test food." Œsophagoscopy showed a small wound of the posterior œsophageal wall 8 inches from the incisor teeth. The patient was detained in hospital for ten days, during which time he complained of slight dysphagia; but at no time was his temperature raised or his pulse-rate increased. He was last radiographed on July 9th, 1934, when the report was: "Small amount of air still present."

CASE 3.—Female, aged 22. Was eating cod on Nov. 28th, 1934, when she felt a bone stick in her throat. On admission to hospital on Dec. 1st examination showed no abnormality. X ray report: "The œsophagus is displaced forwards and to the left, by a swelling (post-œsophageal) level to 1st to 4th D.V. ? Abscess ? air in mediastinum." Œsophagoscopy showed that at the level of the first dorsal vertebra there was an acute œsophagitis which extended downwards for 2½ inches. No foreign body was seen, nor was any wound of the œsophageal mucosa visible. She was kept under observation in hospital for 14 days, during which time the air was gradually absorbed; and whilst an in-patient she exhibited no rise of temperature or increased pulse-rate.

Wright [2] recently reported three somewhat similar cases. One of his patients died of purulent mediastinitis and empyema; one developed a large mediastinal abscess which pointed and was drained above the clavicle; and one made a spontaneous recovery.

Foreign body perforations may occur either through the cervical or the thoracic portion of the œsophagus. Naturally, owing to the relative inaccessibility of the viscus and its intimate relationship to other important organs, the prognosis is graver, and the patient's chances of recovery are more remote, when the lesion is in the latter situation.

The perforation may be caused by the foreign body itself, by the patient's efforts to rid himself of the intruder, or by faulty or careless technique with instruments. Orton [3] has stated that perforating foreign bodies may be classified as those that perforate at once and those that perforate by erosion. Sharp fragments of bones, fish-bones, pins, and sharp pieces of metal cause immediate perforations. Perforation due to ulceration and erosion is usually due to prolonged sojourn of a foreign body in the œsophagus. It is recognised that insoluble organic matter, such as bone with adherent meat, will cause ulceration more rapidly than inorganic objects such as coins, and that the mortality is higher in cases of immediate than in cases of delayed perforation.

The vulnerability of the œsophagus is well known, and it is probable that a large number of perforations are completed by the patient's own efforts—e.g., straining, vomiting and hawking, pushing fingers and spoons down the pharynx, swallowing hard crusts, &c.—but I can find only one example recorded—viz., Berry's [4] account of a case in which a woman perforated her own œsophagus with a corset stiffener in her efforts to remove a foreign body, with fatal results. Instrumental perforations are probably becoming less common as the dangers of the coin-catcher and probang are more generally recognised. Injuries with the œsophagoscope, however, do occur and Friedenwald and Morrison [5] have recorded a series of such cases, all of which ended fatally.

Anatomy of the Region

The majority of perforations take place into the cellular spaces surrounding the œsophagus, and it will be advisable briefly to describe these.

Throughout the greater part of its course from the pharynx to the diaphragm the œsophagus is contained within a definite fascial space. This space has been called by Furstenberg [6] the "visceral space" (Figs. I. and II. and Fig. III. 8). Anteriorly it is limited by the pretracheal fascia and pericardium; laterally by the carotid sheaths of the cervical fascia and mediastinal pleuræ; and posteriorly by the bucco-pharyngeal fascia and its prolongation downwards on the posterior surface of the œsophagus.

Posteriorly to the pharynx and œsophagus is the so-called "retrovisceral" space (*Fig. I. 4, Fig. III. 9*). This is made up of the retro-pharyngeal and retro-œsophageal spaces. It is bounded anteriorly by the bucco-pharyngeal fascia and its mediastinal prolongation, and the vertical part of the diaphragm; laterally by the carotid sheaths and the mediastinal pleuræ; and posteriorly by the prevertebral fascia and the anterior common ligament of the lower thoracic vertebræ.

The areolar tissue of these spaces is of loose texture, and Lambert and Berry[7] have shown that its processes dip in between the leaves of the pulmonary ligaments, and follow the bronchial tree as far as the tertiary bronchi (Fig. II. a). In their opinion inflammatory involvement of these prolongations gives rise to many of the so-called "root-shadows." It is also in continuity with the areolar tissue outside the pleura—the endothoracic fascia (Fig. II. b). Bernard and Mallet-Guy[8] have demonstrated that the adherence of the parietal pleura to the ribs is strongest at the line of costovertebral articulation, the adherence being much less over the intercostal spaces. Extension of inflammation along this endothoracic path gives rise to characteristic shadows with well-defined but irregularly toothed borders, which appear to widen the mediastinal shadow by X ray examination.

The anatomical continuity of these cellular spaces and of their contained viscera and blood-vessels without the interposition of any fascial barriers allows of definite pathways up and down. Their density, however, is not equal throughout, and von Hacker[9] has pointed out that this is greater in the lower part in as much as inflammatory exudates of the upper portion have no great tendency to spread downwards, whereas they readily migrate upwards towards the neck.

Lerche[10] injected a suspension of barium in buttermilk into the groove between the trachea and œsophagus; with moderate force this was found to extend laterally along the œsophagus and trachea to a few centimetres below the bifurcation where it entered the retro-œsophageal region; and there is boundless clinical and other experimental evidence to prove that the continuity of these spaces is a very real and important one.

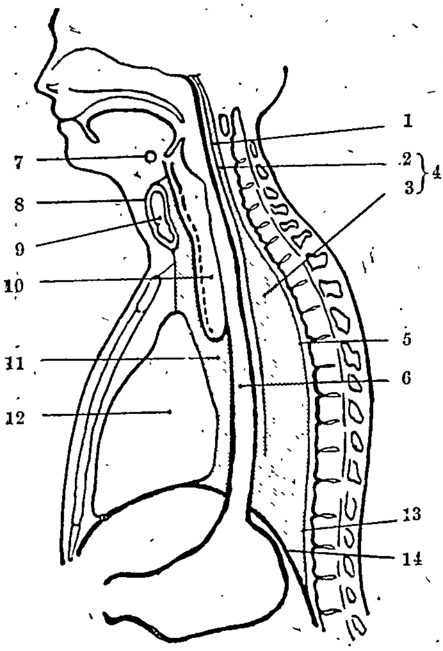

FIG. I.—Diagram of para-œsophageal spaces. (1) Bucco-pharyngeal fascia. (2) Retro-pharyngeal space. (3) Retro-œsophageal space. (4) [illegible] (5) Pre-vertebral fas[illegible] 7) Hyoid bone. (8) P[illegible] Thyroid gland. (10) Trachea. (11) Visceral space. (12) Pericardial sac. (13) Anterior common ligament. (14) Diaphragm.

These cellular spaces are shown diagramatically as the shaded areas in Figs. I.–III. They include the retro-pharyngeal and the retro-œsophageal spaces, the visceral compartment of the deep cervical fascia, a portion of the superior and the entire posterior mediastina; and for the purposes of these notes they will be referred to collectively as the para-œsophageal spaces.

The more important structures contained within, or in relation to, these spaces are the trachea and its bifurcation, the pleuræ and lungs, the aorta, the carotid arteries, internal jugular veins, the azygos veins, thoracic duct, and the pericardium.

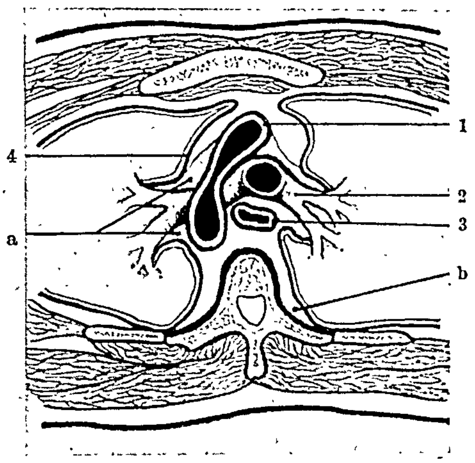

FIG. II.—Diagram of para-œsophageal spaces at level of IVth and Vth dorsal vertebræ. (1) Aortic arch. (2) Right bronchus. (3) Œsophagus. (4) Pleura. (*a*) Tissue extending into pulmonary ligament and hilum. (*b*) Endothoracic fascia.

Symptoms and Signs

Symptoms usually predominate over signs after impaction of a foreign body in the œsophagus, and patients are well aware that "something is stuck in the throat." They complain of pain and dysphagia, which may vary from slight difficulty to complete obstruction. Occasionally such patients may regurgitate or hawk up blood-streaked sputum. Wright[2] has stressed the importance of local tenderness on pressure over the trachea. Tucker[11] considers that it is pathognomonic of the presence of a foreign body in the upper œsophagus if by moving the trachea or larynx towards the point of maximum tenderness, as indicated by the patient, there is a marked increase of pain at this point.

If perforation has occurred, increasing pain is the dominant symptom; but, unless perforation is followed by the escape of air or of infection into the para-œsophageal spaces, it may give rise to no symptoms or signs other than those enumerated above. Lederer and Fishman[12] published an account of a female patient who swallowed over one hundred pins, two hairpins, and five safety-pins, three of which were opened. She manifested no signs or symptoms and voided all the foreign bodies per rectum, yet it is safe to assume that at least one of these sharp bodies perforated the œsophageal wall. This absence of symptoms may be misleading, and Brown[13] has reported two cases of symptomless perforation of the œsophagus, in both of which the patient died subsequently from septic pulmonary complications.

Air may escape through the perforation, giving rise to emphysema. This may occur suddenly owing to straining efforts, or as Seiffert[14] has pointed out it may be brought about gradually by the combined actions of inspiration and a valvular perforation—and not by swallowing air. If the leakage is in the cervical region, it is often accompanied by subcutaneous emphysema, which may be very extensive, reaching down on to the thoracic wall and up into the eyelids and scalp. If it is in the thoracic region there will be a collection of air or gas in the para-œsophageal spaces, which will displace the œsophagus and cause dysphagia. This happened in two of the cases reported above and the X ray appearances are shown in Fig. IV. Uncomplicated para-œsophageal emphysema appears to be a rela-

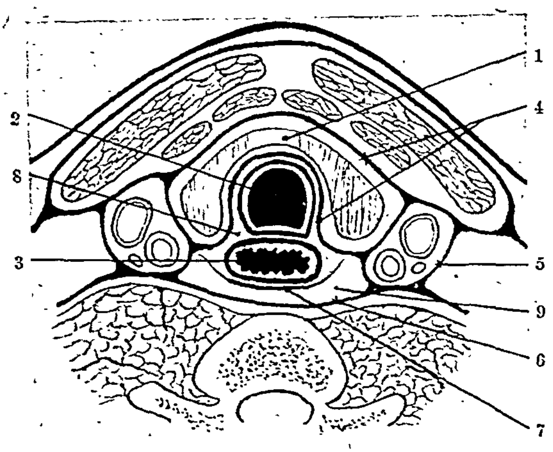

FIG. III.—Para-œsophageal spaces at level of VIIth cervical vertebræ. (1) Thyroid gland. (2) Trachea. (3) Œsophagus. (4) Pretracheal fascia. (5) Carotid sheath. (6) Prevertebral fascia. (7) Œsophageal prolongation of bucco-pharyngeal fascia. (8) Visceral space. (9) Retrovisceral space.

tively benign lesion, although Chevalier Jackson[15] states that it "may prove fatal whether infection follow the leaking air or not." In such cases there are no signs of constitutional disturbance and the only symptoms are dysphagia and pain. It is conceivable, however, that with a massive para-œsophageal collection of air the cardiac and respiratory functions might become considerably embarrassed.

Infection following Perforation

If infection follows a perforation, signs of constitutional disturbance will be manifest and the patient's symptoms become more obvious. Increasing dysphagia with more severe pain, aggravated by attempts to swallow, and a rising temperature and pulse-rate are indications of para-œsophageal infection. Infection usually proceeds to suppuration unless it accompanies gross trauma, when death may ensue before there is time for pus formation.

Infection may be limited and give rise to a localised abscess. This is more likely with a delayed perforation than with an immediate one. In the former case a local peri-œsophageal protective barrier is formed which walls off the abscess cavity from the general para-œsophageal spaces. An abscess so formed may drain into the œsophagus with or without the foreign body in situ. Many observers (Kramer,[16] Tucker,[17] Imperatori,[18] Carmody,[19] Wright,[2]) have recorded cases of para-œsophageal abscess with recovery after endoscopic drainage. Cases have been described in which the entire foreign body had passed through the œsophageal wall and was later recovered from the abscess cavity. In cases in which the abscess cavity becomes shut off from the œsophageal lumen, in the cervical region, the head and neck may be held stiffly towards the affected side and signs of deep pus will become manifest. If drainage is not established the pus may track down into the thoracic portion of the para-œsophageal space.

A localised abscess resulting from a thoracic perforation may track up into the cervical region. Wright,[2] Lerche,[10] and Maclay[20] have reported cases of large para-œsophageal abscess, the two former were opened in the neck and the last in the second right intercostal space, and all recovered. More rarely the abscess may rupture into some portion of the respiratory tract. If this happens, tracheal or bronchial fistulæ may form or pyopneumothorax, pneumonia, pulmonary abscess, or bronchiectasis develop with their train of symptoms. Ballin and Saltzstein[21] report one personal case and quote six others of "transpleural œsophageal fistulæ." These were probably due to extrinsic causes rather than to foreign bodies, but all the patients recovered; and Chaubarrère[22] has recorded a similar case with spontaneous recovery. Orton[3] has reported a case which recovered—the only one out of a series of six—following aspiration of pus from the pleural cavity one month after the perforation.

These localised para-œsophageal lesions after resolution may give rise to fibrous stricture of the œsophagus.

The infection may lead to a generalised cellulitis of the para-œsophageal spaces. It has been stated that this cellulitis may resolve spontaneously and von Eicken[23] has quoted eight cases in which it subsided in this manner. In two other cases recorded, however, following spontaneous resolution, infective thrombo-phlebitis of the internal jugular vein in one (Mosher[24]), and a similar lesion of the azygos vein in the second (Kramer[16]) caused death. Usually a diffuse cellulitis goes on to extensive suppuration throughout the spaces, which always leads to death by septicæmia.

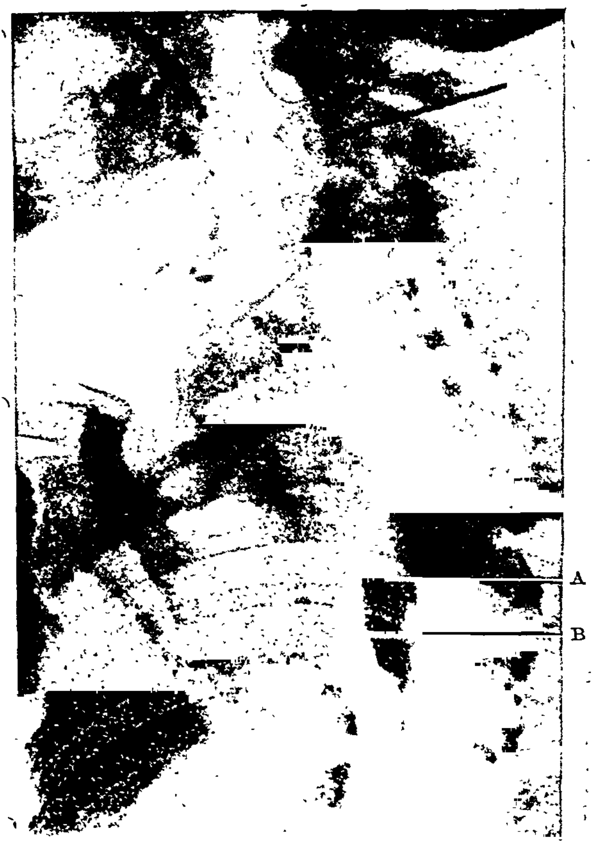

FIG. IV.—A. Localised collection of air in the thoracic para-œsophageal space, displacing forward B, the barium-filled œsophagus.

Fulminating cases appear to be rare except in instrumental perforations, which are usually gross injuries frequently involving the respiratory tract, and accompanied by profound shock. Lyman Richards[25] has concisely and graphically described the results of this accident: "Inside of four hours there is the tragic syndrome of grunting respiration, a tender abdomen, a high fever, and a rapid pulse, which to my mind portends an almost unavoidable tragedy." The foreign body itself may perforate directly into the respiratory tract causing signs and symptoms as described above.

Direct perforation into the aorta or big blood-vessels has been described. Thus Beal,[26] Linn,[27] Doria,[28] and Swain[29] have reported cases of direct perforation by swallowed foreign bodies into the aorta—all of them fatal. Secondary hæmorrhage from the aorta or big vessels may result either from an abscess of the para-œsophageal spaces with subsequent erosion of the vessel wall, or from the prolonged pressure of a smooth rounded object against the vessel. Ter-Oganesjan[30] has collected records of over fifty cases of hæmorrhage from the big vessels, and he reports five of his own.

Diagnosis

Œsophagoscopic diagnosis, except in eroded perforations, is inferential only. A foreign body may be seen actually piercing the œsophageal mucosa, or an abrasion or small punctured wound may be visible. It is, however, often impossible to form an opinion as to whether the entire thickness of the wall has been penetrated. With ulcerated wounds, a view of escaping pus or foul-smelling gas is pathognomonic of perforation. Often the causal relationship of a swallowed foreign body can be presumed only, as it may not be found by œsophagoscopy, or indeed even if the case comes to autopsy. It is wise, therefore, to regard any wound of the mucosa with suspicion and to keep the patient under observation for a few days and to make frequent X ray examinations.

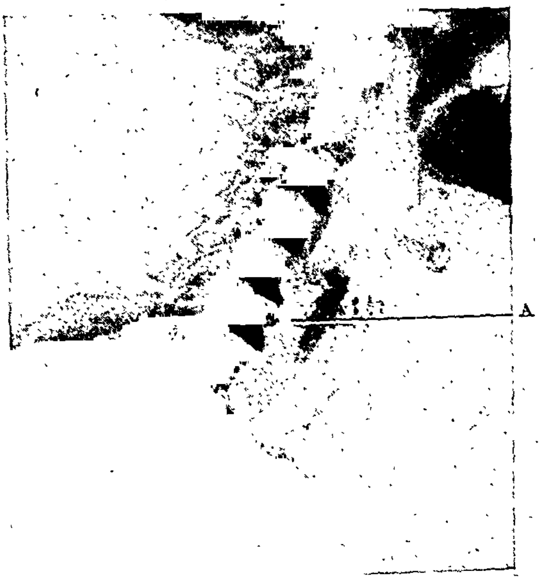

FIG. V.—A. Widening of the post-tracheal space following injury by an upper œsophageal perforation.

At present radiography is our most valuable means of diagnosis. Pancoast[31] has written that "it may be safely stated that abscess of the posterior upper food passage can in most instances be diagnosed roentgenologically before the usual clinical conclusions have been reached or the exact conclusions even suspected, . . ."; and this certainly holds good for perforations by foreign bodies. Thurstan Holland[32] in 1918 formulated a technique for the radiological diagnosis of the presence of non-opaque foreign bodies in the œsophagus. Barium sulphate paste of the consistency of thick cream is given to the patient and its passage through the pharynx and œsophagus watched under the fluorescent screen. The presence of a foreign body or an abrasion of the œsophageal mucosa may be suspected if one or more of the following points are noted: (a) "Hold-up" of opaque material. (b) "Hitch" of opaque material, usually associated with some regurgitation. (c) Retention of a trace of opaque material for 10–30 minutes after swallowing. (d) Retention of a trace of opaque material after swallowing water. (e) Division of the swallowed opaque food into two streams which reunite lower down. This occurs when a flat object lies across the lumen of the œsophagus. (f) "Hold-up" of a small piece of cotton-wool impregnated with barium sulphate paste.

If perforation of the wall has occurred in addition to the above, one or more of the following signs may be observed:—

(a) The presence of gas or air in the para-œsophageal spaces. Iglauer and Ransohoff[33] first drew attention to the X ray appearances of a bubble of air surrounding the point of a perforating foreign body in the cervical region; and the former[34] later stressed the diagnostic importance of the radiological appearance of air in the thoracic region. Such a collection of air in the thoracic para-œsophageal space is illustrated in Fig. IV. (Case 3).

(b) Displacement of the œsophagus. Fig. IV. shows forward displacement of the œsophagus; lateral displacement was also shown in the antero-posterior view of this patient (not reproduced).

(c) Increase of depth of the space between the bodies of the cervical vertebræ and the trachea. Hay[35] has published a table defining the limits of the normality of the width of this space for different ages. Fig. V. illustrates a widening of the post-tracheal space in a patient with a perforating foreign body of the post-cricoid region. This plate is of interest, also, as it shows "lipping" of the bodies of the lower cervical vertebræ—a factor which may have been contributory to the impaction of the foreign body.

(d) In the thoracic region by the presence of a tumour, probably sausage-shaped, in the para-œsophageal space. Since these notes were written Lawson Whale[36] has reported the post-mortem findings in a case of mediastinal abscess of unknown ætiology, and it is interesting to note that Dr. H. H. Sanguinetti describes this abscess as "shaped like a small curved sausage." Cases have been recorded in which opaque material has been observed to completely or partially fill a para-œsophageal abscess cavity.

(e) Widening of the mediastinal shadow in the antero-posterior view—as mentioned above this is probably due to inflammatory involvement of the endothoracic fascia.

(f) The passage of opaque material from the œsophagus into the tracheo-bronchial system or other part of the respiratory system.

(g) If a small quantity of lipiodol is swallowed the shadow of a streak of oil seen outside the œsophagus is proof positive of an œsophageal perforation (Iglauer[34]).

Prognosis and Treatment

It is impossible to estimate the frequency of foreign body perforations as numerous cases remain undiagnosed, but there is a wealth of evidence to prove the gravity of this accident.

Myerson[37] has reported seven cases of perforation of the cervical œsophagus of which four died; and one thoracic perforation which recovered. Lederer and Fishman[12] report two definite and one presumptive cases of perforations—all with recovery. King[38] reports six cases, four cervical and two thoracic, all of which recovered.

Orton[3] reports six cases of para-œsophageal infection, five of which died. Wright[2] records three cases with one death, and the present paper three cases with one death.

Considering the œsophageal foreign body cases collectively, the mortality-rate varies very much. Schlemmer[39] reported 529 cases which had been treated in the period 1909–1919 with 15 deaths. Killian[40] reported 389 cases for the period 1900–1922 with 70 deaths. This high mortality is due probably to inclusion of the earlier years when endoscopic removal was in its infancy and comparatively unknown. Jackson[41] reported 204 cases for a period up to 1923 with 3 deaths. Iglauer and Ransohoff[33] from their investigations concluded that serious complications occur in about 3–2 per cent. of cases of foreign bodies in the œsophagus.

Opinions in regard to treatment vary very considerably, but from our very limited experience and study of the literature, the following would seem feasible: (1) Probangs, coin-catchers and all methods of blind bouginage should be abolished. (2) In all cases of *suspected* foreign bodies in the œsophagus, œsophagoscopy should be performed, even if X ray examination is negative. (3) Any case showing abnormality of the œsophageal mucosa should be kept under observation for a few days. No food should be given by mouth but administered per rectum. Repeated X ray examinations of such patients should be made. (4) Subcutaneous emphysema does not demand puncture unless there is evidence that it is followed by infection. (5) It is justifiable to attempt drainage of a para-œsophageal abscess due to an eroded perforation by endoscopic methods. (6) Known perforations with para-œsophageal emphysema but without general septic symptoms require no active treatment. They should be confined to bed and fluids should be given by the rectum ad lib. and nothing at all by mouth for three or four days. (7) Cases with known perforations and general septic signs must be treated surgically. They require gastrostomy, and if the perforation is: (*a*) Above the level of the fourth dorsal vertebra, the para-œsophageal space should be drained by a "cervical mediastinotomy" after the method of Furstenberg.[6] (*b*) Below the level of the fourth dorsal vertebra, a thoracic surgeon should be requested to drain through a posterior mediastinotomy.

Our thanks are due to Dr. Joseph Unsworth of St. Helens for his notes on Case 1 after her discharge from hospital.

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CHRONIC CONSTRICTIVE PERICARDITIS

(PICK'S DISEASE)

TREATED BY PERICARDIAL RESECTION*

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(*Concluded from p. 548*)

Groups A (cured cases), B (greatly relieved), C (dying primarily from the lesion itself) have now been detailed. There remain for consideration Group D (the cases who died of complications) and Group E (the living patients, in whom the diagnosis was made on clinical grounds and X ray evidence, but not proved by operation).

Group D.—CASES WHO DIED OF COMPLICATIONS

Case 11 died of otitis media, bilateral empyema, and acute pancreatitis a few days after pericardial resection, Case 12 died of chronic *Staphylococcus aureus* infection involving a pericardial sinus and lung abscesses one year after operation, and Case 13 died a few days post-operatively probably of true portal cirrhosis and the effect of posterior pericardial adhesions.

CASE 11.—L. A., male, negro, aged 18, entered the medical service of the Massachusetts General Hospital in August, 1930, acutely ill with a large pericardial effusion and slight fever. The heart sounds were distant; there were no murmurs. There was a markedly "paradoxical" pulse, the cervical veins were distended, and the liver was enlarged. During the course of the next three months the pericardium was tapped ten times and much bloody fluid was removed. Oxygen was injected after four of the pericardial paracenteses in the course of two months in the hope of preventing chronic constrictive pericarditis. This object, however, was not achieved, as will be seen later.

The patient was discharged home on Feb. 7th, 1931, much improved, and he resumed light activity. Shortly, however, swelling of the abdomen and dyspnœa on effort developed and he returned to the hospital. There, on April 16th, 1931, partial pericardial resection was performed by Dr. Whittemore; the patient was slightly but not satisfactorily improved. The microscopic section of the thickened pericardium which was removed showed the presence of tuberculosis. The patient was discharged with draining pericardial sinus to a tuberculosis sanatorium on June 26th, 1931.

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* The St. Cyres Lecture of the National Hospital for Diseases of the Heart, London, July 10th, 1935.

After 11 months in the sanatorium and another few months of convalescence at home and in California he improved a good deal, but soon after this he began to notice the recurrence of dropsy.

He re-entered the hospital on Feb. 5th, 1934, and showed a completely healed anterior thoracic scar, a somewhat enlarged heart with good sounds and no murmurs, neck veins slightly distended, a "paradoxical" pulse, and a blood pressure of 108 mm. systolic and 80 diastolic. There were enlargement of the liver (edge felt four fingers-breadth below the costal border), slight ascites, and moderate œdema of the legs. His serum protein was 4·1 per cent.

The X ray examination showed some increase in the heart shadow and in the supracardiac shadow. There was evidence of partial fixation of the heart, more marked on the right than on the left.

The electrocardiogram showed normal rhythm, rate 70, with low voltage, and low T waves in all leads.

The urine was negative, and blood examination showed leukocytosis 12,000 to 18,000 with no anæmia. The Hinton reaction was negative.

Further surgery seemed indicated, and on Feb. 23rd, 1934, a long incision was made mediate to the old incision extending out toward the axillæ. The sternal muscle flap was turned up and some sternum removed, and also some cartilage of ribs. The pericardium was found very thick and adherent to the heart. Several large sections of the pericardium were freed from the heart and excised, more on the left than on the right. The pericardium which was removed showed fibrosis.

Two weeks after the operation the patient seemed definitely improved. The abdomen was smaller. He had less dependent œdema, and he felt more comfortable. There had been slight spontaneous diuresis for ten days beginning the third day after operation. There was a loss of 5½ lb. in weight as a result of the diuresis. The day after discharge from the hospital he developed a left earache, followed by fever and chills. An acute otitis media had to be treated by incision. Following this there were severe pain in the left flank, nausea, and vomiting, and he was readmitted to the Massachusetts General Hospital very ill on March 16th. He died on March 22nd, 1934, and post-mortem examination showed a bilateral empyema with acute pancreatitis, subsiding left otitis media, chronic tuberculous adhesive pericarditis, cardiac cirrhosis of the liver, ascites, and peripheral œdema.

CASE 12.—Miss H. E. P., female, aged 31 at the time of her admission to the Massachusetts General Hospital, August 5th, 1930. Her past and family histories were of no importance. In 1928, two years before admission, she had an abscess in the right ear followed by severe earache and mastoid pain. There was a discharge for several months from that ear. Soon after the onset of this ear trouble she noticed dyspnœa on exertion, palpitation, and œdema of the ankles at night. For the ear condition she entered the Eye and Ear Infirmary twice, the second time in February, 1930, at which time anæmia was found and treated. Her tonsils were removed in June, 1930. On getting up from bed after this operation she noted an increase in dyspnœa and œdema with some swelling of the abdomen. She was put back to bed, given digitalis, and also treated for a moderate secondary anæmia.

She improved at first but then her symptoms recurred and she entered the Massachusetts General Hospital on April 10th, 1931. Examination showed some cyanosis, increased jugular venous pulsation, no increase in cardiac area to percussion, fair heart sounds with third sound at the apex, dullness at the right lung base, enlarged liver as before, and atrophy of the arms and legs. There was little evidence of ascites. The blood pressure was 120 mm. systolic and 80 diastolic. The pulse was regular at about 90. There was very slight fever, at times up to 99 and 100° F. The blood showed as before secondary anæmia but less severe. There was an occasional leukocytosis. The urine was not remarkable. By chest tap clear straw-coloured fluid was obtained with a specific gravity of 1·018. This fluid was negative for tuberculosis on guinea-pig inoculation. X ray showed slight increase in the width of the heart shadow and calcification of the pericardium forming a definite ring from the region of the pulmonary conus down to the diaphragm. The left auricle appeared to be enlarged. The interlobar septum was visible on the right. There was evidence of a small amount of fluid at the right base.

The electrocardiogram showed auricular premature beats interrupting normal rhythm at a heart-rate of 100 with low voltage and low T waves.

The venous blood pressure was 15 cm.

On April 29th, 1931, she was transferred to the surgical service for decortication of the heart by pericardial resection by Dr. Whittemore. Parts of the fourth, fifth, sixth, and seventh costal cartilages and the edge of the left border of the sternum in this region were removed. The pericardium was opened through a calcified area. In one place there was a small collection of thick, white pus. Culture of the pericardial pus showed no growth and no organisms were seen in the smear. With considerable difficulty a line of cleavage was made between heart and pericardium, and a considerable portion of the anterior pericardium was removed with rongeurs. The apex was free. There was considerable bleeding from the removal of the calcified pericardium in the region of the diaphragm. This was controlled with a gauze pack. The pericardium which was removed showed fibrosis and numerous large foci of calcification. There was no evidence of tuberculosis.

Following the operation the patient seemed more comfortable, and was able to move about more freely. Because of the finding of pus at the time of operation a wick was left in the operative wound, and the sinus continued to drain freely. She showed occasionally a slight fever, but no leukocytosis. She was discharged to a convalescent home on June 11th, 1931. She was readmitted to the hospital on June 28th, 1931, because of chills and fever, pain in the lower left chest, and persistence of the post-operative pericardial sinus. Her general condition was much the same as before. Culture of the pus from the sinus was positive for *Staphylococcus aureus*. The smear showed gram-positive cocci, but no tubercle bacilli. The sinus was discharging thick green pus. During the next few months her condition remained essentially unchanged, but gradually through the winter she grew weaker, with increasing symptoms of pulmonary trouble, and died on April 18th, 1932.

Autopsy showed fibrous pleural adhesions in both chests with two abscess cavities in the right lung, thick calcified pericardium extending in places into the myocardium, and a draining pericardial sinus. The heart was slightly enlarged without dilatation. The mitral ring showed slight calcification. The tricuspid orifice was almost occluded by a ball thrombus, attached by a small pedicle to the wall of the right auricle.

CASE 13.—J. A. H., male, 52, a shoe worker, began to notice shortness of breath on effort in January, 1932. In July, 1932, swelling of the ankles began. In September his œdema had reached the thighs, and he was hospitalised for five weeks. At Christmas time he had the grippe. Pleural effusion developed and in February each pleural cavity was tapped with the removal of much straw-coloured fluid. He showed some asthmatic wheezing after each tap. Chest taps were continued from April, 1933, at the rate of about one a week until his entrance to the Massachusetts General Hospital on Sept. 23rd, 1933. He lost strength steadily over this period of time, but the œdema of his legs subsided somewhat. His past history was entirely unimportant. He had tonsillectomy eight years before, after tonsillitis. Family history was unimportant. Physical examination on admission to the Massachusetts General Hospital on Sept. 22nd, 1933, showed a well-developed and nourished man, slightly dyspnœic, but in no great discomfort. The cervical veins were engorged and pulsating, with his head and neck at an angle of 45°. The cardiac apex impulse was poorly felt. Percussion dullness was slightly increased. The heart rhythm was absolutely irregular, and the rate was 60. The blood pressure was 104 mm. systolic and 60 diastolic. There were a moderately loud blowing systolic murmur and a loud third sound at the apex. The pulmonary second sound was slightly accentuated and reduplicated. There were no diastolic murmurs. The pulses were small. There was dullness to flatness below the angle of the right scapula and at the extreme left base, with diminished breath sounds and slight pleural friction rub at the right base. There was slight œdema over the lower back and of both legs up into the thighs. There was moderate ascites. The liver edge was palpable, five fingers-breadth below the costal margin; it was not tender.

Fluid which was obtained from abdominal and pleural cavities was evidently a transudate. When inoculated into a guinea-pig, the abdominal fluid was negative for tuberculosis.

The urine showed slight albuminuria. The blood was normal except for slight secondary anæmia. The serum protein measured 5·3 per cent. The Wassermann reaction was negative

X ray examination showed extensive calcification of the pericardium, especially in a circular region from the pulmonary artery downward to the diaphragmatic surface of the heart and transversely to the midline. Pulsation of the heart was not evident except at the apex where it was quite distinct. There was considerable fluid in both pleural cavities.

The electrocardiogram showed auricular fibrillation with a ventricular rate varying from 60 to 110, and markedly low voltage with inverted T waves in Leads 1 and 2.

After observation in the ward over a period of ten days this patient was transferred for operation, and on Sept. 30th, 1933, Dr. Churchill performed pericardial resection. The pericardium was found greatly thickened and calcified, particularly over the right ventricle. The line of cleavage was established over the left ventricle, and the pericardium was freed around the apex at the left side of the heart. With considerable difficulty the calcified pericardium was removed from the right ventricle and the diaphragmatic pericardium was resected down to the vena cava. There was a stormy post-operative course with pulmonary œdema. Both pleural cavities were again tapped, the right on Oct. 3rd and the left on the 4th. He died suddenly on Oct. 5th.

Post-mortem examination showed chronic adhesive pericarditis with calcification, especially posteriorly, but without evidence of tuberculosis, acute and chronic bronchitis and slight broncho-pneumonia, pulmonary œdema, slight right hydrothorax, chronic fibrous bilateral pleuritis, marked cirrhosis of the (liver of the chronic portal type, not of the lesser degree associated ordinarily with cardiac cirrhosis), perisplenitis, cholelithiasis, ascites, and peripheral œdema.

Group E.—LIVING CASES NOT PROVED BY OPERATION

Two living cases were not proved by operation but by characteristic signs and X ray evidence of pericardial calcification.

Case 14.—W. J. B., a physician in general practice, aged 57 years, consulted me, Jan. 4th, 1930, with the following history.

He had had "dry pleurisy" in 1894 while studying medicine. Closely following this there was fever with enlargement of the liver and neck veins which persisted for several months that summer. The legs were also slightly swollen. He resumed his studies and improved slowly so that he lost his œdema, but his liver remained somewhat enlarged. From 1896 to 1916 he carried on a vigorous country practice with little limitation, but some dyspnœa on climbing stairs. In 1916 he had a respiratory infection followed by some congestion of his liver and legs. He improved, but again the next year, 1917, he had influenza, and after that serious congestion from which he gradually recovered in the course of a year. He resumed work in 1918. In 1922 he began to have paroxysms of very irregular tachycardia lasting several days and recurring every two or three months. He took some digitalis for this. The attacks decreased gradually in frequency so that in 1927 and 1928 he had only five or six paroxysms altogether. At Christmas time in 1928 he had another respiratory infection and this was followed by constant cardiac arrhythmia. In April, 1929, his wife died suddenly, and following this shock he was forced to go to bed, and had acute congestion lasting three months. With rest and digitalis he had slowly improved up to the time of his visit to me. On examination I found him well developed and nourished with the following abnormalities; slight to moderate fullness of the arm and neck veins, heart very slightly enlarged in size with a loud third sound at the apex (there were no murmurs), very irregular heart rhythm with a rate of 75, and the liver enlarged with a non-tender edge felt two fingers-breadth below the costal border. There was no evidence of ascites or œdema of the shins. The lungs were clear. The blood pressure was 115 systolic and 85 diastolic. The electrocardiogram showed auricular fibrillation with a ventricular rate of 70 to 80, and low T waves. Fluoroscopic examination showed the heart somewhat enlarged, and somewhat fixed, with areas of pericardial calcification, especially at the left upper and inferior borders of the heart.

Pericardial resection was not advised, because of his age and relatively slight incapacity. On Oct. 22nd, 1930, he was examined again and showed no changes. On June 8th, 1932, he wrote of his reasonably good health with the same signs as before. He was carrying on a light practice.

Case 15.—Mr. A. B., Jewish tailor, aged 45 years. He had always been well and active except that for a number of years he had noticed gradually increasing shortness of breath. In the summer of 1930 because of chronic constipation and heart-burn he went to a local hospital for study. There he was told that he had an abnormal heart condition. He returned home improved. In the fall of 1930 he had much increase in dyspnœa on exertion with a feeling of weakness, and stopped work. In the summer of 1931 he began to develop swelling of his ankles and abdomen and had some aching pain in his precordial region. He contracted a cold and sore-throat which caused him much discomfort and a troublesome cough. His physician told him that his heart was very bad, and gave him digitalis. In January, 1932, the swelling of his ankles increased and he had to sleep with his head high at night. His coughing was continuous. Early in February, 1932, he fainted and thereafter was sent to bed; shortly after this was referred to me for study and entered the Massachusetts General Hospital. The past history revealed no illnesses except for influenza in 1918 and 1920. The family history was not remarkable.

Physical examination showed a well-developed and nourished man, moderately dyspnœic, with slight cyanosis. His voice was hoarse. His tongue was slightly coated. His cervical veins were engorged. His tonsils were moderately enlarged. The heart was slightly enlarged. The sounds were fair, the pulmonary second sound accentuated. There were no murmurs. There was no Broadbent's sign. The heart rhythm was absolutely irregular. The pulse was small. The apex heart-rate was 130. The rate at the wrist was 100. The blood pressure was 115 mm. systolic and 90 diastolic. The lungs showed emphysematous breathing throughout with scattered coarse râles, and slight dullness at the right base. The abdomen was distended, the liver much enlarged. There was a considerable amount of ascites, but there was no œdema over the shins. Fluoroscopic examination showed moderate enlargement of the heart, especially at the left upper border with increase in the lung hilus shadows and pericardial calcification, easily seen about the apex in the right anterior oblique position. The electrocardiogram showed auricular fibrillation with a ventricular rate of 130 and diphasic S–T intervals in Leads 2 and 3. The voltage was rather low. The urine was normal. The blood was normal. The Hinton reaction was negative. The venous pressure was 21·5 cm.

He improved in the course of the next three weeks after digitalisation. His heart-rate dropped to 80. His liver decreased somewhat in size. The ascites and right hydrothorax disappeared. His neck veins remained only slightly engorged. His cyanosis was considerably less.

This improvement did not continue for long and in spite of constant digitalis therapy he was in a poor state of health when examined in September, 1934, with increasing dyspnœa, small pulse pressure (110 mm. systolic, 90 diastolic), big liver, and dropsy (slight ascites and slight œdema over the shins). Pericardial resection was considered but not done; he was by no means an ideal case for it.

Diagnosis

I shall now summarise our experience with these 15 cases of chronic constrictive pericarditis so far as it applies to the diagnosis of the condition. Twelve of the cases were proved by operation, one other by autopsy, and the remaining two by clinical evidence and X ray. Several other probable cases that I have seen I have not included.

Sex.—Nine of the 15 cases were males and 6 were females.

Age.—The ages of the individual cases at the onset of their trouble ranged from 5½ to 50 years, and at the time of operation from 11 to 52 years; at the time of the last follow-up note they were as follows: Well at 11, 14, 14, 21, 25, and 32 years. Much improved at 20. In mediocre health at 48 and 60. Dead at 22, 23, 32, 32, 36, and 52 years. Our oldest case successfully operated upon was in her thirty-first year.

Race.—Six of the 15 cases were of English stock, three French-Canadian, two Irish-American, one German-American, one Polish-American, one Jewish-American, and one Negro-American.

Cause.—The ætiology of the chronic pericardial disease can be assigned as follows: tuberculosis in two (questionable in two others), pneumonia with polyserositis (including both pleuritis and pericarditis) in two, sepsis in one, rheumatism in none, uncertain or unknown in ten (in five of which, however, there was a definite history of acute pericarditis). The absence of the rheumatic infection as an ætiological factor in our series is striking and is a distinct contradiction to frequent statements in the literature, even by present-day authorities, which are based as a rule on little or no personal experience or on cases not strictly belonging to this group, that is, on cases whose symptoms and signs are primarily due to valvular or myocardial disease or on cases in whom external pericardial adhesions are playing the preponderant rôle. It is of further interest that a series of 1000 children with the rheumatic infection studied at the House of the Good Samaritan in Boston, and followed over a period of ten years has shown in not a single instance any evidence of chronic constrictive pericarditis, even though the heart was often seriously involved in other respects and even though acute pericarditis had been noted in many cases during their acute rheumatic infection. Certainly, therefore, if rheumatism can cause Pick's disease it does so in only the rarest cases. As a matter of fact Chevers[9] had pointed this out in 1842.

Symptoms.—The first symptoms were dyspnœa in four cases, abdominal enlargement (that is, a big liver and ascites) in three, dyspnœa and abdominal enlargement in three, œdema of the feet and abdominal enlargement in two, œdema of the ankles in one, œdema of the face and abdominal enlargement in one, and soreness in the right upper quadrant in one. In all cases abdominal enlargement was present at some time during the illness; it was the only uniform symptom, but swelling of the feet and dyspnœa at some time or other also occurred in most of the cases. There was little pain or palpitation. Weakness was occasional. Some patients showed loss of weight in the upper part of the body. There was no fever except in two patients with subacute tuberculous infections and in several cases during intercurrent acute infections. In several cases it was clear that the symptoms of acute pericardial involvement passed over into those of chronic constrictive pericarditis.

Signs.—Two signs were consistently present in all cases: (1) *enlargement of the liver*—non-tender and non-pulsating—usually *with much ascites*, and (2) *engorgement of the jugular veins* with or without evident pulsation. The venous pressure when measured before operation was usually between 20 and 30 cm., three times or more the normal.

The reason for the preponderance of liver enlargement and ascites in the dropsy of the majority of cases of chronic constrictive pericarditis is probably to be found in the greater obstruction of the flow in these cases from the hepatic veins at or near their outlet into the inferior vena cava than of the flow in the vena cava itself. Such obstruction may be due to the pressure of locally constricting adhesions, or of fluid (as in acute pericardial effusion), or to anatomical variations in the venous relationships. Much further study of this problem is needed. It is to be noted in this connexion that dependent or generalised œdema antedated or overshadowed the liver enlargement and ascites in a few of our cases.

The *size of the heart* was normal in seven cases, slightly enlarged in five, and moderately enlarged in three. In at least some of the cases with apparent slight enlargement the thickness of the fibrosed pericardium itself could account for the increased measurements by X ray or physical examination. There were no *heart murmurs* in 12 cases; systolic murmurs, slight to moderate, were heard at the apex in the other three. There were no diastolic murmurs. The heart rhythm was normal in 11 cases, except for some extrasystoles in one; in the remaining four cases there was auricular fibrillation.

The *blood pressure* and *pulse pressure* were low in 11 of the 15 cases and low normal in the other four. In seven cases a well-marked "*paradoxical*" *or Griesinger-Kussmaul pulse* was noted, in two cases it was said not to be present, and in the remaining six cases it was apparently not looked for.

Broadbent's sign[6] was noted in no case, nor was inspiratory collapse of the neck veins; Friedreich[17] in 1864 had called attention to the presence of this latter sign in two cases of adhesive pericarditis, but it is important to note, as he himself stated, that the cause of this sign is in the action of external adhesions, and *not* from the effect of a constricting pericardium. There was *effusion into the pleural cavities*, in the nature of a transudate, in seven of the cases, generally in the sicker patients, and in one other case there was a terminal empyema.

Œdema of the legs was present in 10 of the 15 patients, being marked in four. The abdominal and thoracic walls were œdematous in seven patients and the face was swollen in two.

In no case was the spleen felt definitely.

X ray.—The heart shadow was normal in size by X ray in seven of the cases and slightly to moderately enlarged in the remainder. The shape varied greatly from normal to so-called mitral with prominence of the left upper border, and in three cases there was indication of left auricular enlargement (two of these patients had auricular fibrillation). The amount of pulsation present varied widely from fairly free on both sides to little or none anywhere. It was quite a common finding to observe free pulsation at the cardiac apex and left border with no pulsation at the right border (which would extend a little too far to the right with a hazy outline). In most cases there was an increase in the supracardiac shadow, apparently due to dilatation of the superior vena cava and to mediastinal involvement or displacement. The lung hilus shadows were increased in over half the cases (nine). In several (six) a clue was presented by the finding of considerable pleural thickening. The heart itself was more or less anchored in six cases, with or without restricted movements of the diaphragm on one side or the other. Pericardial calcification was noted by X ray in six of the 15 cases, but before operation in only three of the 12 cases that were operated upon. The presence of calcification is a helpful confirmatory sign, but it is usually absent, and when present it does not mean Pick's disease if there are no other evidences —pericardial calcification by itself does not indicate the need of surgery.

Electrocardiography.—Much help has come from the electrocardiogram, especially in doubtful cases. In all of the 14 cases electrocardiographed the record was abnormal in one of two respects: there was either low voltage (in five) or inversion or flattening of the T waves in Lead 1 or Lead 2 or both leads (in ten) —in one case both these anomalies were present. The inversion of the T waves was of the so-called coronary type, like that also found in many cases of acute pericarditis. The heart-rate varied widely. Normal rhythm was the rule, but auricular fibrillation was present in four of the 15 cases. It is of interest that the electrocardiographic abnormalities may persist in whole or in part after operation, even in the cured cases—in fact a complete return to normal has, in our small series of cases, occurred once only, namely in Case 4, in which after operation the electrocardiogram was perfectly normal. The reasons for the occurrence of the abnormalities and for their persistence are still obscure.

The *blood* frequently showed slight anæmia and usually but not always a low serum protein. A frequent figure for the serum protein was 3·5 to 4·5 milligrammes per cent. with increase after the correction of the trouble. The lower readings were found in the more chronic and sicker patients and were dependent probably on the combination of general malnutrition and the loss of protein in the ascitic fluid.

The *liver function* was sometimes slightly reduced. The urine was generally normal.

Differential Diagnosis

In the differential diagnosis of chronic constrictive pericarditis the following conditions must be taken into consideration, arranged in order according to their likelihood of confusion: mitral stenosis, polyserositis, cirrhosis of the liver, nutritional or other œdema, mediastinal tumours, tricuspid valve disease. According to my experience only the first four named conditions are likely to be confused with chronic constrictive pericarditis.

Mitral stenosis is to be differentiated by the finding of its characteristic diastolic murmur at the cardiac apex, in the absence of a severe active rheumatic infection. The presence of mitral stenosis may be taken at once as ruling out chronic constrictive pericarditis of any serious grade. Two cases have been sent to me in the last year for consideration of pericardial resection who showed on careful study mitral stenosis, confirmed at post-mortem examination; we recognised clinically the true state of affairs and so did not operate on these cases. The error in diagnosis had resulted from the finding of chronic preponderant abdominal enlargement (big liver and ascites) with engorgement of neck veins plus the failure to discover the characteristic diastolic murmur of mitral stenosis. The error of omission in these cases was due to the fact that auscultation had not been practised in exactly the right spot, that is, at the cardiac apex which happened to be far out in the anterior axillary line. The very fact that the heart was much enlarged in both these cases was in itself sufficient to rule out the diagnosis of chronic constrictive pericarditis as the fundamental condition.

Polyserositis.—A very common misunderstanding has been to confuse polyserositis with Pick's disease; mixed up in this confusion has been a general erroneous viewpoint concerning perihepatitis or iced or frosted liver (Zuckergussleber of Curschmann).[13] Polyserositis, or an inflammation of several serous cavities, sometimes called Concato's disease,[11] is occasionally found in young individuals, due to tuberculosis, associated with pneumonia, or, most commonly of unknown cause. The pleuræ and pericardium are the serous cavities generally involved, but sometimes the peritoneum is also affected. The infection begins as an acute process, sometimes insidious and obscure with little clinical evidence and sometimes severe and easily diagnosed; it goes on to a chronic fibrous state of varying importance. Polyserositis is not Pick's disease, although it may be the infection that precedes it in some cases. Neither is Pick's disease polyserositis, although the two frequently coincide. Chronic pleuritis of considerable degree occasionally accompanies chronic constrictive pericarditis, as does also chronic peritonitis. Perihepatitis resulting in the frosted or iced liver (Zuckergussleber), first clearly discussed by Curschmann,[13] may or may not be found in Pick's disease; it is not a necessary part of the disease. If there has been enough peritonitis during the polyserositis that may precede Pick's disease, then the liver may become frosted, or the spleen, or even the intestines, but in our series of cases among six whose livers were seen at necropsy (four patients) or at operation (omentopexy in two patients) there was chronic perihepatitis (icing or frosting) in none, that is, the liver capsule happened to be smooth and relatively thin in all, even though the liver showed considerable nodular fibrosis in one of them and was slightly nodular in two others. The most common site apparently for the chronic peritonitis is the under surface of the diaphragm; this was found in two of the six cases mentioned above (one at post-mortem examination and one at operation.) There has arisen a question as to the possible influence of the blocking of the lymphatic flow in that region to help to explain the persistence of the ascites in some cases. Perihepatitis, perisplenitis, and even frosting of the intestine itself may occur quite independently of pericarditis or pleuritis; they may be found associated or as isolated lesions.[4]

Portal cirrhosis of the liver should be easily distinguished from chronic constrictive pericarditis in nearly every case. The relative youthfulness of the patients with Pick's disease, their absence of a history of alcoholism or serious infection or other factor pointing to cirrhosis of the liver as the chief lesion, their small often "paradoxical" pulse with low pulse pressure, and particularly the apparently conclusive finding of increased pressure in the neck veins quickly distinguish them from cases of primary cirrhosis of the liver. The changes in the liver in most cases of chronic constrictive pericarditis are relatively slight and consist of vascular congestion plus the so-called cardiac cirrhosis, fibrous strands radiating from the central veins towards the interlobular spaces. The more chronic severe cases show a larger amount of this fibrosis, but not the degree of liver damage seen in primary cirrhosis of the liver. One of the five cases of our series (Case 13) whose liver tissue was examined, showed a high degree of cirrhosis which our pathologist (Dr. Tracy B. Mallory) believes to have been largely independent of his chronic constrictive pericarditis and to have been an important factor in hastening his post-operative death. His age was 52 years. Two other cases, a man (Case 11) and a woman (Case 12) both with severe symptoms and signs of chronic constrictive pericarditis over an interval of several years, showed a considerable degree of liver fibrosis, probably the result of an advanced chronic constrictive pericarditis. Most of the cases have some slight reduction of liver function as shown by special tests (such as with Rose Bengal or bromsulphalein), but not the high degree of dye retention found in the presence of jaundice or in a few cases of severe portal cirrhosis of the liver.

Nutritional œdema is easily distinguished from chronic constrictive pericarditis. It presents quite a different picture save for the generalised œdema, which may occur in some cases of Pick's disease, and the lower serum protein (below 5 per cent.) also found in some cases of Pick's disease, particularly in those with chronic malnutrition. The increased venous pressure, preponderant liver enlargement, and course of the illness quickly label as such the patients with chronic constrictive pericarditis.

Prognosis

The prognosis of Pick's disease without surgical treatment is unfavourable for health and in some cases for life. It tends to be a chronic disease, lasting several to many years, and often remaining at a standstill for long intervals of time. In a few instances as in several of our series, the downhill course may be rapid, ending in death from the disease itself or from complications in the course of months or a year or two. Remissions may occur, especially if favoured by therapy such as rest, diuretic drugs, and fluid and salt restriction, as pointed out in his own noted case by Finsen[16] 35 years ago. Spontaneous cure probably does not exist; surgery affords the only real cure, which in our experience has been effective for at least seven years.

The occasional cases of apparent recovery for intervals of months or years after the occurrence of symptoms and signs of cardiac compression before a recurrence of persistent symptoms and signs of much the same sort are undoubtedly to be explained as having had, at first, an acute pericarditis with effusion which subsided, and later on, after healing, constriction from a chronically contracted fibrosed pericardial sac (with or without calcification, which is in large part incidental).

Treatment

The so-called *Delorme operation*,[14 32] of pericardial resection is the only cure for chronic constrictive pericarditis or Pick's disease. It is evident that Brauer's simple operation[5] of removal of ribs over the heart, once called cardiolysis but better designated thoracolysis, cannot help in the least in freeing the heart from its shell of fibrous pericardium, although this operation may be useful in rare cases where there are important external adhesions glueing the heart to the chest wall itself, or in patients with very large hearts which raise the ribs in systole and not only increase their work thereby but cause much precordial discomfort.

There are four essentials for a successful operation of pericardial resection: (1) the evaluation of symptoms and signs that makes the diagnosis certain, (2) the selection of a case that is more or less crippled and yet a reasonable risk for the extensive operation that is necessary, (3) an expert anæsthetist (our cases have had general anæsthesia under ether), and (4) an experienced thoracic surgeon who is bold and yet cautious, who will do enough to free the heart and yet not too much to endanger the patient's life. It is possible to operate more than once to free adhesions and in at least one case on record the posterior surface of the heart has been successfully decorticated in a second operation after the anterior surface of the heart had been freed in a first operation. The commonly expressed fear that constricting adhesions once removed may reform has proved entirely groundless not only in our experience at the Massachusetts General Hospital but in that of others, in the absence of an acute or subacute pericarditis. When a second operation has been done at the site of an early resection the approach to the heart has been easy and rapid, only unimportant non-constricting adhesions having developed; the border of the unresected thickened constricting pericardium is easily identified.

THE STEPS OF THE OPERATION

In brief, the operation,[10] under ether anæsthesia, consists of the exposure of the pericardium and heart by the removal of the fourth, fifth, and sixth left costal cartilages and rib ends by costotome, and of the left part of the sternum by a special knife. The left pleura is identified and retracted; it is frequently adherent and sometimes extends unusually far to the right. The left border of the right pleura underlies the sternum and must also be looked for prior to beginning the pericardial dissection in that region. When the pericardium is reached it is scrutinised and opened at the most favourable point. In some cases there are only slight adhesions at the cardiac apex or along the left heart border or elsewhere, and the sites are then to be selected for the beginning of the dissection; in other cases the pericardium is closely adherent and calloused or even calcified over the entire surface of the heart, and then the dissection may begin in any convenient area, and may be continued more or less radially. It is best, so far as it is possible, to free the left heart chambers before the right, so that there may not be a flooding of the pulmonary circulation when the right chambers are freed first while the left chambers remain constricted.

The vital part of the operation—*that is*, the decortication of the heart—begins after about an hour's preparation of the field. Both blunt dissection and sharp dissection are used to free the heart itself from the constricting pericardium, which may be thick tough parietal pericardium, dense epicardium, or both securely or even inseparably united. Sometimes a line of cleavage is easily found but often it is not and one must then use great care to avoid splitting the muscle itself and entering one of the heart chambers, the right ventricle or right auricle in particular. However, even if the heart is penetrated the wound may be quickly repaired, as happened in two of our own successful cases (Cases 2 and 5); leaving a strip of pericardium attached to the heart as one dissects permits its use as a patch of tissue to suture over the wound. The thickened, or even calcified, pericardium is cut away in rather small pieces (averaging about 1 to 4 square c.cm. in area) while the dissection is in progress. In the usual course of operation the cardiac apex, the anterior surface of the right ventricle, the anterior surface of the right auricle, as much of the diaphragmatic surface of the heart as can be reached, and the inferior and superior venæ cavæ are freed so far as possible, in the order named. The dissection takes about an hour. The thoracic muscles and overlying tissue and skin are then sutured in place over the heart, and the patient is returned to bed to remain under an oxygen tent for as long as may be deemed necessary. My colleague, Dr. E. D. Churchill, plans to publish the details of his operative experience in these cases. Without his invaluable assistance I could not have so quickly collected data from proved cases relative to the diagnosis of chronic constrictive pericarditis. I take the greatest pleasure in acknowledging my indebtedness to him.

Two methods of treatment of chronic constrictive pericarditis which should be discarded because of their ineffectiveness, evident both in theory and practice, are: (1) digitalis therapy, and (2) omentopexy or the Talma operation.

Summary and Conclusion

A study of the literature and an analysis of a series of fifteen personal cases of chronic constrictive pericarditis, or Pick's disease, have shown that in the diagnosis one should take into consideration not individual signs alone but the entire clinical picture and history of the case. The leading clues are the result of "inflow stasis," namely, (1) the insidious onset of dropsy in a young person, (2) preponderant liver enlargement and ascites, (3) increased prominence of the jugular veins, (4) normal or relatively normal heart in the presence of dropsy without nephritis, and (5) low blood and pulse pressure and paradoxical pulse. Other important clues are (6) X ray evidence (poor pulsation, calcification, chronic pleuritis), (7) electrocardiographic abnormalities (low voltage or "coronary" T waves in chronic disease in early youth), and (8) a previous history of acute pericarditis or polyserositis.

Chronic constrictive pericarditis has been confused with four other conditions, but with ordinary care and thought such errors of diagnosis should not arise. The four conditions are mitral stenosis, polyserositis (including instances of perihepatitis or frosted or iced liver—Zuckergussleber), primary cirrhosis of the liver, and nutritional œdema. Two other conditions—namely, tricuspid stenosis and mediastinal tumours—may also cause some of the same signs.

The prognosis of cases with chronic constrictive pericarditis for good health is poor unless suitable for, and submitted to operation, although mild or only moderately severe cases may live for many years a semi-invalid life requiring much rest and frequent or occasional abdominal paracenteses.

Cure is now possible by surgery and an imposing number of successful cases of pericardial resection (by the Delorme operation, and not by that proposed by Brauer) is being accumulated. In our own clinic twelve cases have had this operation performed, ten by one surgeon; of these latter ten cases, six have been completely cured and one other relieved to a high degree. The first successful case in America, operated on seven years ago in 1928,[10] belongs to this group; this patient, a young woman, is in excellent health to-day, as are the other five cases of complete cure.

In closing, I would emphasise, that these are but progress notes; much yet remains to be learned about this important subject, but the obscurities are certain to yield to a richer experience.

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KENT AND SUSSEX HOSPITAL.—A sum of £15,000 is needed to wipe off the debt on the building fund of this hospital. There is an average of 190 patients in the wards and a waiting-list for more. The total receipts for the half year were £12,400, and expenditure was £13,726.

THE TREATMENT OF OBESITY*

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OBESITY is a symptom, not a disease, and the first tep in its treatment is to determine whether the ain causative factor is exogenous or endogenous. n most cases of obesity, and always in those of xogenous origin, food intake exceeds energy output nd the rational line of treatment is to decrease food nd increase muscular activity. Endogenous obesity alls for substitution therapy, for the governing efect in metabolism arises from dysfunction in ome part of the endocrine system, notably the hyroid, pituitary, or sex glands. Mixed types, ossessing both exogenous and endogenous features, re numerous and require a combined line of therapy. t is necessary at the onset therefore to take a careful istory, with especial reference to the patient's abits of life, food, and exercise and the occurrence f obesity in close relatives. A full clinical examinaion should also be made, reinforced where possible y laboratory tests, particularly a sugar-tolerance urve, an estimation of the basal metabolic rate, and radiological examination of the pituitary fossa. n each case there is, in my opinion, a second mportant point to be decided if treatment is to e successful. Is the patient healthy, apart from the emporary impairment of function due to fat infiltratng or accumulating on vital organs, or is there a owering of general efficiency due to associated disease n other systems, particularly the circulatory and the espiratory ? The two following cases illustrate this point.

A man in the sixties whose business forces him to lead n unhygienic life as regards food and exercise has paid everal visits to Ruthin Castle in the last few years. Apart rom his overweight he is in good condition and so can tand strict diet and vigorous exercise. In 183 days of treatment he has lost 168 lb. in weight, an average daily loss of 0·9 lb. Weight has been regained between treatments and he is now 12 lb. heavier than when first seen, though he has lost just 12 st. under treatment in the intervening period. He belongs to what I would call the "healthy or simple" obesity type.

Another man of about the same age was admitted with fibrositis, brachial neuritis, a blood pressure of 200/100, marked glycosuria, and a blood-sugar ranging from 0·18–0·24 per cent. His weight was 12 st. 7 lb. and under treatment it fell 14 lb. in five weeks, an average daily loss of 0·4 lb. On leaving, the blood pressure was 160/90, the blood-sugar 0·13–0·14 per cent., and he was free from pain in the arm and sugar in the urine. This patient typifies "unhealthy or complicated" obesity.

Treatment was on the same general lines in both cases but there was difference in detail, particularly as to rate of reduction, and in each case the final result was satisfactory.

It is the failure to recognise the possible association of obesity with lowered bodily efficiency and resistance that leads to unwished-for results and even tragedy. This is seen where loss of weight is too rapid and in the reduction often carried out by patients themselves, without proper supervision and by unsuitable means. For example, a man nearing seventy who was bronchitic and arthritic as well as obese, was treated elsewhere, with strict diet, internal and external douchings, purgation, and massage. He lost 2½ st. in under a month, but was laid up most of the next four months with his joints and chest, and when he had "recovered" from his "cure" found to his disgust that he had regained most of the lost weight. We found that it was possible to produce more permanent results by less drastic methods. It is to be noted in passing that the weight lost in these rapid reductions is almost as rapidly regained. If the patient is to remain well he must acquire a mode of life, particularly as regards food, which will enable him to keep his appetite and so his weight within bounds. This takes time and too rapid reduction often defeats its own ends. In the great majority of the cases, with which we as medical practitioners have to deal, reduction is not undertaken with a view to producing spectacular results as shown by a weighing machine, but to increase the efficiency and well-being of our patients. Obesity has been described as falling into three grades according to its severity—the enviable or regal, the comical, and the pitiable. Our duty is to restore our patients to the normal.

Four Lines of Attack

In the direct treatment of obesity there are four lines of attack: two major, (1) diet, (2) exercise; and two minor, (3) drugs and (4) physical treatment. Except in some cases of endogenous obesity, diet and exercise are of paramount importance.

DIET

It is a common belief that a successful reduction diet must, of necessity, be unpalatable, unpleasant, and unsatisfying. This need not be so, provided care is taken in the selection of the component foodstuffs and variations are allowed for. Sir Edmund Spriggs, a pioneer of the measured and varied diet in obesity, made this clear enough when addressing[1] the Medical Society of London in January, 1929. "If," he said, "the amounts are measured there is hardly any food which may not be allowed—at least in small quantities. . . . It is essential to teach the patient that it is the total caloric value which counts, otherwise he runs away with the idea that some foods are fattening and that others, such as fruit, toast and biscuits of protein or rye are not, and that an obese person can be reduced by permitting this and forbidding that, irrespective of amount."

Many types of diet are described, varying in their composition, attractiveness, and reliability. One well-known American diet is made up of fruit and vegetables, bran, gluten bread, cheese, and buttermilk. Another somewhat similar one, which I have seen give good results, allows for breakfast: dried bread, fruit, milk, and tea; for lunch: omelette, salad, fruit, and dried bread; only tea and skim milk at teatime; and for dinner: steak, fillet of beef or chop, salad, and dried bread. The danger with the somewhat bizarre diets is that "after the cure" the patient is tempted to return to his fleshpots with renewed vigour. Mere reduction of quantities is not enough and a well-balanced reduction diet combines considerable protein, reduced carbohydrate and fat, made up of foodstuffs chosen so as to provide a bulky vehicle. Excess carbohydrate is often the cause of the obesity, but it should not be reduced so as to make the diet unpalatable, the patient lose energy or develop an acidosis. Vegetables and fruit make for bulk and are a convenient way to give carbohydrate; they also help in preventing constipation. Enough protein should be given to balance the loss of body protein due to daily wear and tear. This can be done in the early stages of reduction, but it is difficult to provide the necessary two to three ounces when the daily intake falls below 900 calories. The body loses weight by the oxidation of its fat and the release of water. Fat in the food is therefore strictly rationed, allowing enough to supply the necessary fat-soluble vitamins. It is interesting to compare the number of calories derived from carbohydrate, protein, and fat respectively, in an ordinary diet of 2600 calories and in a reduction diet of 1300 calories. In the ordinary diet caloric proportions are carbohydrate 55 per cent., protein 14 per cent., fat 31 per cent., and in the reduction diet, carbohydrate 34 per cent., protein 33 per cent., and the fat 33 per cent. In reducing the nutritive value of the diet by one-half the proportion of carbohydrate has been notably decreased, the proportion of protein greatly increased, and the proportion of fat is almost unchanged.

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* The substance of this paper was contributed to the discussion on obesity held by the section of medicine at the annual meeting of the British Medical Association at Melbourne on Sept. 11th.

Patients often ask how much water they may drink. If there is associated circulatory disease the amount should be kept low, but otherwise, on a weighed diet, no restrictions need be imposed. When the food is not weighed fluids are taken at the end of a meal after all the solid food has been eaten. There are certain precautions worth taking in the preparation of food. Butter and lard should not be used in cooking, fried foods should be avoided, lean meat should be chosen and it is best roasted or grilled. Tinned fruit should be washed in three or four changes of water and fresh stewed fruit sweetened with saccharin, which, in liquid or tablet form, provides a suitable substitute for sugar in a reduction dietary.

At Ruthin Castle, for convenience in working, we have a number of carefully balanced diets, ranging in caloric value from 1400–500 calories a day (List 1). In use these standard diets are regarded as a basis, and are varied in most instances to meet the needs and idiosyncrasies of individual patients. It may be necessary to replace one foodstuff with another more palatable one, or even to rearrange the whole day's menu so as to approximate as closely as possible to the meals the patients will take on leaving the clinic (Lists 2 and 3). It is important for the patient to be kept contented and not irritated by the restrictions imposed, and at the same time trained so that he may continue the régime in a modified form on his return to everyday life.

STANDARD DIETS

LIST 1

Ruthin Castle Standard Reduction Diets

Weights are given in grammes (30 g. = 1 oz.)

No.	1	2	3	4	5	6	7	8	9	10
Calories	1400	1300	1200	1100	1000	900	800	700	600	500
Carbohydrate ..	112	107	98	92	77	71	61	59	48	45
Protein	113	105	96	87	89	70	61	54	50	37
Fat	48	44	42	38	37	33	31	24	21	17
Hemicellulose ..	8	7	7	7	6	5	4	4	3	3
Breakfast										
Toast	25	25	20	20	15	15	15	15	10	10
or white bread ..	30	30	25	25	18	18	18	18	12	12
Butter	15	10	10	10	10	10	10	5	5	5
Fish group ..	180	150	120	120	100	100	90	90	75	50
Milk	75	75	60	60	60	60	60	50	40	30
Sugar-free marm.	15	15	15	15	15	15	15	15	15	15
Tea or coffee ..										
*Lunch**										
Toast	20	20	20	20	15	15	10	10	10	10
or white bread ..	25	25	25	25	18	18	12	12	12	12
Meat group ..	90	90	90	75	75	60	50	40	40	30
Vegetables ..	200	180	150	150	120	120	120	120	100	108
Fruit stewed, unsweetened ..	100	90	90	75	75	75	60	60	50	50
or fresh fruit ..	130	120	120	100	100	100	75	75	65	65
Tea										
Bread and butter	30	30	30	25	25	25	25	25	15	10
Milk	75	75	60	60	60	60	60	45	40	30
Sugar-free jam ..	15	15	15	15	15	15	15	15	15	15
Tea										
Extra fresh fruit during day ..	170	150	120	120	75					

**Dinner*—as lunch with addition of reduction soup.

LIST 2

Example of a Diet of 1500 Calories (approx.)

In each list weights are given in grammes; ounces in parentheses.

Breakfast.—Grilled fish 120 (4), grilled fish 75 (2½) and one egg, bacon 20 (⅔) with tomato 90 (3), cold ham 60 (2), bacon 15 (½) and one egg or two eggs; toast 30 (1), butter 10 (⅓), sugarless marmalade 15 (½), milk 45 (1½), tea.

Dinner.—Roast beef or roast mutton (hot or cold) 90 (3), grilled steak, boiled beef, grilled chop, boiled mutton, roast turkey or chicken 105 (3½), veal 120 (4), grilled sweetbreads 90 (3) with bacon 20 (⅔), or liver 90 (3) with bacon 10 (⅓); vegetables (excluding potato) 120 (4) or salad (without dressing) 120 (4); stewed fruit 90 (3) or fresh fruit 120 (4); toast 30 (1), butter 10 (⅓).

Evening.—Fried fish 105 (3½) or meat as at dinner or scrambled eggs, two; vegetables and salad and fruit as dinner; cheese 30 (1); toast 30 (1); butter 10 (⅓); milk 45 (1½); tea. If vegetables are omitted toast may be increased to 40 (1⅓).

Supper.—Two water biscuits; milk 30 (1); tea.

LIST 3

Example of a Diet of 1000 Calories (approx.)

Breakfast.—Grilled fish 120 (4), grilled fish 75 (2½) with one egg, bacon 20 (⅔) with tomato 90 (3), cold ham 60 (2), bacon 15 (½) and one egg, or two eggs (boiled or poached); toast 15 (½); butter 5 (⅙); sugarless marmalade 15 (½); milk 45 (1½); tea.

Dinner.—Roast beef or roast mutton (hot or cold) 60 (2), grilled steak, boiled beef, grilled chop, boiled mutton, roast turkey or chicken 75 (2½), veal 90 (3), grilled sweetbreads 90 (3) with bacon 10 (⅓), or liver 105 (3½); vegetables 120 (4) or salad 120 (4); stewed fruit 90 (3) or fresh fruit 120 (4); toast 15 (½); butter 5 (⅙).

Evening.—Fried fish 75 (2½) or meat as at dinner or two eggs (boiled or poached or as omelette); vegetables, fruit, toast, and butter as dinner; milk 45 (1½); tea. If vegetables are omitted toast may be increased to 30 (1).

Supper.—Two water biscuits; milk 30 (1); tea.

LIST 4

Instructions Given to Patients on Leaving Hospital

The diet should be made up as far as possible from fish, eggs and meat (except as stated below), green vegetables, parsnips, carrots, turnips, celery, mushrooms, cauliflower, onions, tomatoes, beetroot or salad, stewed and fresh fruits. Bread, toast, rusks, water biscuits, butter, cream, and cereals should be taken in small quantities only.

Foods to be avoided are: sugar, puddings, creams, cakes, sweet biscuits, shortbread, and nuts.

Salmon, herrings, pork, duck, bacon, savouries, rich sauces, potatoes, cheese, and made-up dishes such as pies, fricassées, rissoles, sausages, and macaroni cheese, which are concentrated foods, should be taken sparingly.

So far as possible no fluid should be drunk during meals until all the solid food has been eaten. A daily walk should be taken out of doors.

Example of a day's diet.—The food need not be weighed, though an occasional check is advisable; weights used in an average diet are given in grammes (30 g. = 1 oz.) and in ounces (parentheses).

Breakfast.—Grilled fish 120 (4), fish 75 (2½) and one egg, bacon 15 (½) and one egg, cold ham 30 (1) and one egg, two eggs, or bacon 30 (1); bread 20 (⅔); butter 5 (⅙); sugarless marmalade 15 (½); milk 60 (2); tea or coffee.

Lunch.—Fish 120 (4) or meat 60 (2); two vegetables 75 (2½) of each or salad 120 (4); unsweetened fruit 90 (3) or fresh raspberries, strawberries, gooseberries, or melon 200 (6⅔), greengages, peaches, nectarines, grape fruit, or orange 150 (5), cherries, apples, pears, plums, or grapes 120 (4), banana or figs 60 (2); bread 20 (⅔); butter 5 (⅙).

Tea.—Bread or water biscuits 15 (½); butter 5 (⅙); sugarless jam 15 (½); milk 45 (1½); tea.

Dinner.—Clear soup or soup made from vegetables only; fish 40 (1⅓); meat, vegetables, and fruit as at lunch; bread 20 (⅔); butter 5 (⅙).

Bread or toast should not exceed 75 g. (2½ oz.) and butter 20 g. (⅔ oz.) in the day. The body-weight should be taken regularly once a fortnight and an increase on two successive weighings followed by a stricter diet.

In deciding the caloric value of the diet with which to begin, attention is paid to previous habits as regards food and exercise and to the present physical condition. Each case must be judged on its merits, remembering that it is better to give too much in the early stages rather than too little. When a base line has been established the diet can be altered as required, preferably on the day of the weekly weighing, taking into consideration the general condition of the patient as well as the change of weight shown by the scales. It is rather astonishing what a difference can be made by slight modifications. Thus a glass of milk and a biscuit several times a week in the dietary of a man leading a regular life as regards food and exercise produced a gain of half a stone in six months, and it took nearly the same time for the original weight to be regained after the extra food was omitted. At Ruthin Castle the lowest standard diet is 500 calories a day. Cases are reported however where patients are said to have gone for months on a daily intake of under 400 calories, without ill-effects.[3]

Once patients have begun treatment they are anxious to lose weight quickly and try to stampede their medical adviser into arranging "starvation days" or "fast days" and the like. As a rule they require protection against themselves in this respect. Fluid days have their place in treatment, particularly in the early stages and again when the flabby fat has been got rid of and the weight tends to be stationary on a low diet and adequate exercise. A diet suitable for a fluid day may be made up as follows :—

Soup (clear stock soup, chicken tea or broth, marmite soup, oxo, bovril, &c.) or the juice of two oranges in a little water at 11 A.M., 1 P.M, 6 P.M., and 8 P.M., varied with tea and a little milk or lemon at 8 A.M., 4 P.M., and 10 P.M. In addition, water or simple lemonade may be taken as desired. On a soup day the patient receives 62 calories if whole oranges are given instead of the juice only, the caloric value rises to 410 and on the orange day 162 calories. According to his condition the patient on a fluid day takes full or reduced exercise or spends the day quietly in bed. If there is any doubt as to stamina, fluid days are best omitted and in any case should not be allowed more than once in seven or ten days.

To obtain the best results close coöperation and frankness between patient, doctor, and dietist are essential. "Breaking diet" is the great temptation and often great tact is required to prevent it. Hunger between meals can generally be appeased by a breakfast cup of clear soup and if this is not enough a slice or two of cold lean meat is given. Cold meat is preferable to hot as it is more readily available and more easily cleared of its surplus fat. In hospital the food can be supervised, varied, and weighed in a way not possible in a private house, and to counteract this as far as possible each patient, on leaving, is given written instructions for his guidance (List 4).

EXERCISE

Exercise should be prescribed as carefully as diet and consists for the main part of walking, putting, golf, and even tennis in suitable cases. Here also it is wise to begin quietly and increase gradually according to the weight lost and the response shown in the patient's general condition. The difference of pulse-rate and blood pressure before and after exercise is of great value in gauging how much a patient is capable of, and how much is good for him. Healthy tiredness is good, but exhaustion and fatigue are to be avoided. Exercise should be regular and steady and it requires constant supervision and encouragement to ensure this. A walk in the morning and some game in the afternoon is a good arrangement and a variation may be made by taking a 'bus or car in one direction and walking the other. The stiffer part of the walk, against the wind or uphill, should be done on the outward journey when fresh, and as a general rule walking alone is to be preferred.

The patient should be encouraged to regard his daily walk as an essential part of his treatment, which, if faithfully carried out, will produce a sense of mental and physical satisfaction in addition to melting his too solid flesh. Regular exercise demands regular rests, and periods of activity and inactivity should alternate. A good plan is to exercise in the morning and afternoon, with a rest after the midday meal and again before the evening one. This is difficult to arrange in ordinary life, but a useful substitute will be found in walking part of the way to and from the office or train, morning and evening, with a quiet time after the midday meal. Strenuous or "potted" exercise at week-ends, after a sedentary week, often does more harm than good and the same criticism applies to vigorous exercise before breakfast, though it suits some people. Before sanctioning either of these measures the doctor should satisfy himself that it is in the interest of the patient. Moderate exercise increases body metabolism three times and severe exercise nine times,[4] and with obese patients on active hospital treatment an occasional slack day is good policy: allowing a motor run, visit to a cinema, or something similar to replace the usual outdoor routine. It makes a pleasant break and prevents staleness. To take severe or even moderate exercise on a reduction diet calls for courage and determination, and as the labourer is worthy of his hire so is the hard-working reduction patient deserving of his occasional day of rest.

DRUGS

On theoretical grounds drugs should be the sole treatment necessary in endogenous obesity, and where hypothyroidism is the cause this is so, thyroid being specific. Rigid dieting is not required in these cases and as a rule is badly tolerated. In the other types of endogenous obesity the results from glandular therapy alone are uncertain and generally disappointing. This may be due to the unsuitability of the preparations at our disposal coupled with our incomplete understanding of the functional interlocking of the ductless glands. Where the obesity is genital or pituitary in origin we use diet, exercise, and thyroid, adding pituitary extracts in the pituitary cases and controlling the dosage by estimation of the basal metabolic rate and sugar tolerance. The evening pulse, if taken regularly, is a simple and useful guide in thyroid medication, as a rise of 10 to 15 beats per minute points to overdosage. In exogenous obesity and in many cases where an endocrine element may be suspected, but cannot be proved, thyroid plays an important part. When the weight tends to become stationary and it is thought unwise to decrease diet or increase exercise any further, a small dose of thyroid (gr. ¼–1 of the dried extract) should be given twice a day, unless some contra-indication is present. If necessary the dose may be increased later up to grs. 2 or 2½, and I have never seen any ill-effects follow its use in this way. It is better not to let the patient know what he is taking, and it should be made quite clear that the drug is an adjuvant to, and not a substitute for, diet and exercise. Patients taking their own thyroid at home should be given a limited quantity at a time or instructed to omit it for the last ten days in each month. Unless under regular supervision they should be warned as to the early symptoms of hyperthyroidism. There is a danger of establishing thyroid addiction unless precautions of this nature be taken.

A woman, for social reasons, began to slim by the aid of thyroid without her doctor's knowledge or consent, and in three months lost over 4 st. in weight. She was admitted to Ruthin Castle with a pulse-rate of over 120 per minute and complaining of shortness of breath, general weakness, palpitation, and nausea. A week after withdrawal of the thyroid the pulse-rate was 80, the breathing normal, and weight was being gained. In the next few years she had several relapses, always due to self-prescribed thyroid, accompanied by congestive heart failure and finally auricular fibrillation and œdema. In one attack withdrawal of thyroid and administration of salyrgan raised the daily output of urine from 200 c.cm. to 4000 c.cm. and lowered her weight by 1½ st. in eight days.[5]

Certain dinitrophenol substances are being used in preference to thyroid as they are claimed to have a less disturbing constitutional effect. They are said to raise the basal metabolic rate but not to have any effect on pulse-rate or blood pressure. This would appear to be a disadvantage, as the pulse-rate is helpful in controlling this type of medication. The most useful sphere for pluriglandular extracts such as Hormotone and Iodobesin is where obesity is combined with menstrual or climacteric disorders. In glandular therapy, as with diet and exercise, it is wise to begin quietly and increase the dose according to the patient's loss of weight and general response.

PHYSICAL TREATMENT

The patient can be made more comfortable by certain forms of physical treatment, though their effect on the weight is almost negligible. Massage strengthens the muscles and so facilitates the taking of more exercise. The belief, so generally held, that "hard or deep" massage "breaks up the fat" and so reduces weight is in our experience a fallacy. The electric light bath, by producing a profuse diaphoresis, improves the feel of the skin and the general tone, but the weight lost as fluid is as a rule regained within 24 hours. The electric stimulus, arranged to make the muscles contract against resistance, as in the Bergonié chair, is stimulating and soothing and often induces sleep. It is of particular use when circulatory disease limits exercise.

Results

There are few chronic disabilities where so great an improvement in the well-being of the patient follows a good start on proper lines. On a controlled diet and graduated exercise patients benefit, even when no weight is lost, and the loss of a few pounds will make a difference to the comfort, quite disproportionate to the result shown by the scales. Here a word of caution is needed. In the first week on diet and exercise the patient feels lighter and brighter in every way and looks forward with every confidence to the next weighing. Unless a warning has been given there is often great disappointment when it is found that the loss is very small, perhaps under 1 lb. In one girl of 23 there was no loss of weight in the first six days, though she stated she felt "totally different." With no essential change of régime, 9 lb. was lost in the following three weeks and thereafter 2 lb. a week. With steady carefully controlled reduction much good can be done and the results at times are comparable to those seen in myxœdema after thyroid medication.

Thus a woman of 51 had deteriorated mentally and physically while gaining weight over four or five years. She was slovenly and even dirty in her personal habits, her speech had become coarse, her mode of life varied between senseless extravagance and equally needless parsimony, and she had to be helped in and out of bed. With diet, exercises, and later a small dose of thyroid (gr. ½ twice a day) her weight fell from above 18 st. to below 12 st. She could then walk four miles a day comfortably, was bright and cheerful, clean in person, dress, and speech, and was leading an ordinary life socially.

We consider a loss of 10–14 lb. a month as sufficient in uncomplicated cases, though there is great individual variation: 26 lb. was lost by one man in 20 days, including 10 lb. in the first six and a half days, but this is exceptional. The greatest loss shown in Ruthin Castle records for one continuous course of treatment was 12 st. This was in a man of 30 years of age, and took eight and a half months, his weight falling from 25 to 13 st. Women often hold their weight or even gain in the week before a period: this is generally followed by an extra drop once the menstrual disturbance is over.

Insistence on a salt-free diet does not seem necessary, but patients are generally advised to content themselves with the salt used in cooking and to add as little as possible at the table. Bread is often a difficulty, and if the limited amount allowed produces hardship the addition of casein bread will often solve the trouble. The state of the feet should be inquired into when considering exercise, as obese people are particularly subject to corns, weakness of the arches and ankles, and, at times, their inability to take exercise is due to this.

For example, a woman of 61 attributed her overweight to restricted exercise due to multiple callosities on the soles of both feet. She was put on a mild reduction diet and after the corns had been treated walking exercise was begun. During her stay in hospital she lost 30 lb. in weight and another 1 st. after her return home. When admitted 400 yards at a time was her limit, but later she walked two to three miles in comfort.

The urine of reduction patients should be examined regularly, and if acidosis appears the carbohydrate in the diet increased. In our experience this is rarely necessary though some physicians give glucose at intervals or daily alkalis as a safeguard. Constipation is more often seen, but an increase in fruit or vegetables with a teaspoonful of liquid paraffin twice a day is as a rule enough to overcome it. The weekly weighing day is the patient's dread and the physician's bugbear, and special care is needed after these occasions to ensure that the régime is not relaxed or made stricter unreasonably as a result of what the scales reveal. The habit of regular weekly or fortnightly weighings should be continued after leaving hospital and an increase in weight on two successive weighings calls for a stricter diet or a consultation with the patient's doctor.

Much can be done to improve the mental outlook and physical condition of the obese. As a rule they are outwardly cheerful but when their confidence is gained it is generally found that they regard their disability more anxiously and resentfully than appears to the casual observer. With careful treatment and steady encouragement they respond well and "one is astonished at the unanimity with which patients report a return to vigour, a feeling of well-being and resistance to fatigue which has been lost for months or years."[3] Such a therapeutic result is worth working for.

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OBSERVATIONS UPON BILIARY DRAINAGE

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Much has been written on the technique and also on the diagnostic and therapeutic uses of biliary drainage. The present paper, based on over 100 cases in which it was used, makes no claim to review all these aspects of the subject. The group of cases analysed are selected from a much larger number, and form a series in which the diagnosis was definite and the biliary stimulus always the same—namely, 50 c.cm. of 33 per cent. warm magnesium sulphate solution. Any cases in which the position of the tube in the duodenum has been uncertain have been excluded, and in some the drainage has been performed twice or even three times if the result has been doubtful.

Biliary drainage has been carried out, first, on a number of persons whose biliary and hepatic systems was presumably healthy. A few of these have had no illness; the others have been sufferers from arthritis (12), hyperthyroidism (5), iridocyclitis (5), Ménière's disease (2), and neurosis (5). For purposes of comparison I have regarded these as normals.

It might be supposed that the rate and volume of biliary flow would enable us to draw conclusions about biliary disease, comparable to those we draw from the flow of urine. That hope, however, has not been fulfilled. The onset and the amount of flow after the introduction of the stimulus give little indication whether disease is present or not (Table I.).

Table I.—*Average Onset, Rate, and Volume of Bile-flow* (74 *Cases*)

Type of case.	No.	Time to onset of flow.	Duration of flow.	Total bile flow.	Flow per minute.
		mins.	mins.	c.cm.	c.cm.
Normal patients ..	22	9	28	40	1·4
Pathological gall-bladder (cholecystitis)	16	6	24	50	2·0
Gall-stones ..	6	3	27	46	1·7
Liver disease ..	20	8	27	45	1·7
Cholecystectomy ..	10	7	14	40	3·0

Even with a seriously damaged liver (e.g., in advanced cirrhosis) bile is secreted after the injection of magnesium sulphate in about normal quantity after the normal latent period and at about the normal rate. On the other hand, the flow is certainly much faster after removal of the gall-bladder, and this suggests that the quantity and rate of flow, after the dose of magnesium sulphate, is governed less by the organic condition of the liver than by some controlling influence of the gall-bladder; the normal response to the introduction of magnesium sulphate seems to be an *emptying* of the gall-bladder and liver, and is not wholly dependant upon liver secretion.

Similarly it might be hoped that the symptoms produced by reflex stimulation of the biliary flow would give some indication of disease in the gall-bladder when this contracts and empties its contents. The symptoms, however, prove no certain guide (Table II.). A gall-bladder containing stones may empty its contents normally with no symptoms or discomfort, and this is of interest in relation to the causation of symptoms in cholelithiasis. As a rule, however, there is considerable discomfort, and sometimes severe pain over the gall-bladder and in the right hypochondrium and epigastrium, during the flow. Patients who have had their gall-bladders removed are particularly apt to have severe nausea, discomfort, or vomiting while the flow is in progress. Also symptoms are about twice as common in chronic cholecystitis, and about four times as common in the presence of stones, as they are in the normal subject. Hence the course of the drainage should be carefully watched and noted. In severe cirrhosis of the liver there is rarely pain or discomfort, and in only 4 patients out of 21 suffering from hepatic disease was there vomiting during or immediately after the flow of bile.

Table II.—*Reaction to Introduction of Warm Magnesium Sulphate into Duodenum* (133 *Cases*)
(50 c.cm. of 33 per cent. solution)

Type of case.	No.	Showing symptoms.*	Showing no symptoms.	Per cent. showing symptoms.
Normal patients ..	37	6	31	16
Liver disease.. ..	21	4	17	19
Pathological gall-bladder (cholecystitis)	13	4	9	38
Proved gall-stones ..	10	7	3	70
Patients after cholecystectomy ..	11	9	2	82
Migraine patients ..	41	16	25	39

* Nausea, pain, discomfort, vomiting.

Undue stress should not, however, be laid on these findings, owing to the unavoidable psychological effect of carrying out the test. (Special care was taken in these cases not to let the patient think that anything other than water was being injected down the tube.) It is known also that symptoms may vary with the type of stimulus employed so that from the diagnostic point of view results in different hands may be difficult to compare.

Another fact that is remarkable is that such a relatively large dose of magnesium sulphate introduced direct into the duodenum—about 4 drachms of the salt—causes nausea or discomfort in less than 1 in 5 normal subjects; and if the bile is removed by the tube it seldom produces much diarrhœa. The same dose introduced into the stomach usually causes profuse diarrhœa and, as would be expected, more nausea and vomiting. This observation suggests that part at least of the purgative effect of magnesium sulphate is dependant either upon the increased flow of bile into the intestine or upon the effect of the salt in the stomach where it may set up gastro-colic stimulation either chemically or reflexly.

Complete failure to obtain any bile after introduction of the magnesium sulphate is very rare, provided care is taken to ensure the correct position of the tube. In five patients only have I noted complete absence of any reflex biliary flow to this stimulus, though in no case was the test abandoned under 35 minutes, and in most cases not till a longer time had elapsed. (In 3 of these cases 1 c.cm. of pituitrin given subcutaneously also failed to bring about withdrawal of bile from the tube.) In all these there was no doubt about the position of the tube, but the only response to the introduction of the usual stimulus was a slow secretion of 15–20 c.cm. of thick mucoid white fluid, strongly alkaline, which I regard as pancreatic in origin.

Four of these five patients showed a curiously similar clinical picture. Three were female and one male. All were very neurotic and all complained of long-standing upper abdominal discomfort, with attacks of severe pain amounting to true colic, coming on two or three hours after food. Three of them were woken about 2 A.M. with severe pain, and all stated that they could not eat eggs or fat without discomfort or pain. In two cases the symptoms had followed a severe mental shock. Only three of these patients were radiographed after administration of tetraiodophenolphthalein by mouth and of these two showed no shadow of the dye; the third gave a normal concentration. One of the patients showing no dye shadow was operated upon later and the report was "enlarged gall-bladder; no stones; no inflammatory changes. Cystic duct constricted. Cholecystectomy performed." In this patient an eight-hour residue in the stomach was also shown by barium meal, without any evidence of any organic lesion.

I think that these five patients almost certainly belong to the group of functional spastic dyskinesias of the gall-bladder (Westphal, Newman), due to nervous causes, and in the absence of obstructive jaundice complete failure to obtain any bile is suggestive of such functional disorder of the biliary passages.

TABLE III.—*Concentrated "B" Bile*

Type of case.	No.	"B" bile.		Per cent. showing *no* "B" bile.
		Present.	Absent.	
Normal patients	22	19	3	14
Pathological gall-bladder (cholecystitis)	16	4	12	75
Gall-stones	8	3	5	62
Liver disease..	19	16	3	17
After cholecystectomy ..	10	0	10	100
Migraine patients	35	27	8	23

Failure to withdraw any concentrated "B" bile, which comes at least in part from the gall-bladder itself, has very much less significance however (again in the absence of obstructive jaundice). From Table III. it will be seen that in over 10 per cent. of normal subjects no gall-bladder (or "B" bile) was found. In none of 10 patients subjected to biliary drainage at periods from 3 months to 14 years after cholecystectomy was any true concentrated "B" bile obtained, though certain workers state that it may be recovered in a proportion of such patients (Martin).

In only about a quarter of the cases of gall-bladder disease have I obtained a normally concentrated "B" bile.

As a rule, when "B" bile is not obtained, the cholecystographic shadow is below normal; but there is a divergence of some 30–40 per cent. in my cases both in patients showing a normal shadow and those giving no shadow or an abnormally faint one. (Table IV.). The second group shows the diagnostic significance of a positive cholecystogram (absent or very faint shadow) combined with the withdrawal of a normal concentrated "B" bile. This is a highly characteristic finding in liver disease, and I have noted it in 7 cases of cirrhosis of the liver (4 of which were proved by operation). Such a combination is likely when the liver is so diseased that it fails to pick out the opaque dye from the portal circulation in sufficient concentration, whereas biliary concentration in the gall-bladder (being healthy) is unimpaired so that dark "B" bile is obtained by drainage. The use of the two methods in combination may therefore be worth while where cirrhosis of the liver is suspected. A further characteristic feature of severe cirrhosis of the liver is the striking appearance of the bile which has a bright red colour, unlike the normal yellow, brown, or dark mahogany tinge.

TABLE IV.—*Oral Cholecystography and Biliary Drainage*

Oral cholecystogram.	No.	Concentrated bile.	No concentrated bile.	Percentage agreement.
Normal shadow ..	20	12	8*	60
Absent or very faint shadow	25	8†	17	70

* 8 cases: 1 cholecystitis (oper.), 3 cholecystitis (?), 3 migraine, 1 normal.

† 8 cases: 7 cirrhosis of liver, 1 migraine.

As regards the chemical, microscopic, and bacteriological findings in bile, I only propose to mention two points. The first refers to the significance of crystals on microscopic examination, since some writers have regarded the findings of both cholesterol and pigment deposits together as pathognomonic of gall-stones (Bochus). Thus Piersol records that all his cases in which both crystals were found proved to have calculi; of 40 patients investigated by Rafsky, in whom both types of crystals were found in the bile, only 1 showed no calculi or cholecystitis at operation. The observation is one of considerable diagnostic importance, but there are a few records of the incidence of these crystals in the bile of normal people.

Table V. shows the microscopic findings in my patients, in all of whom the bile was examined soon after withdrawal—just as urine must be examined if significance is to be attached to crystalline deposits. In 9 out of 43 (21 per cent.) of my presumed normal subjects both types of crystals were present; they were also found in 10 out of 13 cases of proved gall-stones. (I have not attempted any quantitative comparison of the numbers of crystals.) From this it seems that the coexistence of cholesterol and

TABLE V.—*Crystalline Deposits in Bile* (91 *Cases*)

Type of case.	No.	Cholesterol only.	Pigment only.	Cholesterol and pigment.	No crystalline deposit seen.
		No. and per cent.	No. and per cent.	No. and per cent.	
Normal patients ..	43	14 (33)	18 (42)	9 (21)	1
Liver disease ..	14	1 (7)	5 (36)	5 (36)	3
Pathological gall-bladder (cholecystitis)	10	1 (10)	8 (80)	1 (10)	–
Proved gall-stones.	13	0	3 (23)	10 (77)	–
After cholecystectomy	11	2 (19)	1 (9)	7 (64)	–

calcium bilirubinate crystals cannot be regarded as pathognomonic of gall-stones, though strongly suggestive of that condition. It is significant that the proportion of cases showing both types of crystals was about the same after cholecystectomy (almost always for gall-stones) as in subjects of cholelithiasis which implies that there is some underlying abnormality of the bile in gall-stone subjects, apart from inflammatory changes in the gall-bladder itself.

The last point concerns the significance of protein in the bile, as tested by the very rough Esbach's estimation. I have found 0·5 part per 1000 represents an empirical normal level, and that the level is increased in more than half the cases of cirrhosis and other diseases of the liver, and also in about the same proportion of cases of gall-bladder disease. It appears that a marked increase of albumin in the bile may be due either to alteration in the secretion of bile by the liver, or to its concentration by the gall-bladder. In a number of migraine patients showing a *dense* shadow by cholecystography—which means that the concentration of gall-bladder bile is increased—the protein content of the bile was particularly high.

I do not think the protein content of the bile is of practical value in the diagnosis of gall-stones or cholelithiasis. In all cases the figures refer to the protein estimated in the most concentrated specimens of bile obtained in each case, though there is usually little difference in this respect between the various fractions of bile removed.

SUMMARY

(1) Observations upon biliary drainage in over 100 cases, using magnesium sulphate as a stimulus, are recorded. (2) The rate and volume of biliary flow gave no indication as to the condition of the liver, gall-bladder, or biliary passages. (3) Pain, nausea, and other symptoms were observed during the flow of bile in 16 per cent. of normal subjects, but more frequently in the presence of gall-bladder disease. (4) Failure to obtain any bile by drainage, in the absence of jaundice, was rare (5 cases only); dyskinesia of the gall-bladder is suggested as a cause in some of these patients. (5) In 10 per cent. of normal subjects and 75 per cent. of cases of gall-bladder disease no "B" bile could be withdrawn. (6) Results are compared between oral cholecystography and biliary drainage in 45 cases; failure to visualise the gall-bladder by oral cholecystography, in association with the finding of "B" bile by drainage, was found to be characteristic of liver disease. (7) Calcium bilirubinate (pigment) and cholesterol crystals were found together in the bile in 21 of normal subjects and 77 per cent. of gall-stone subjects.

My thanks are due to the trustees of the Mackenzie-Mackinnon Research fellowship; also to Dr. H. Orton and Dr. Courtenay Gage for very kindly carrying out the radiographic examinations, and to my colleagues at St. Mary's Hospital for allowing me to investigate patients under their care.

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A CASE OF AGRANULOCYTIC ANGINA

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A WOMAN aged 47, unmarried, was admitted to Ham Green Isolation Hospital (Bristol Public Health Department) on May 24th, 1935, the case being notified as one of suspected faucial diphtheria.

History of illness.—She first consulted her doctor on April 2nd, 1935, complaining of a sore-throat which developed by the 5th into a definite follicular tonsillitis. Swabs taken were returned negative. The throat condition did not clear up until April 14th. On May 21st there was a recurrence rather worse than the previous attack, which rapidly became more severe. On May 23rd an area of inflammation appeared on the dorsum of the left hand.

On admission (May 24th) the general condition was poor and the patient appeared to be acutely ill. The temperature was 103° F., the pulse-rate 128, and the respirations 28. Tongue furred. The fauces showed yellow semi-membranous sloughs with very little inflammatory reaction apart from narrow areas of erythema around each. Heart sounds poor, lungs normal; the spleen was not palpable and there was no jaundice. The urine contained a trace of albumin. The lower part of the nose was inflamed and swollen, and the dorsum of the left hand and lower forearm showed a large inflamed area with a blackish superficial necrosis and no attempt at pus formation. The surrounding tissues were soft. Antistreptococcal serum (20 c.cm.) together with antidiphtheritic serum (800 units) was administered intramuscularly.

Progress.—By the following day (May 25th) there was no improvement in the patient's condition and the possibility of this being a case of agranulocytic angina was discussed. A leucocyte count gave a figure of 625 per c.mm. Examination of blood films revealed an obvious neutropenia; some of the smears showed less than a dozen white cells in all and these were chiefly lymphocytes. A differential count, based on 50 cells only, resulted as follows:—

Polynuclears	6 %	Transitionals	6 %
Small lymphocytes ..	66 %	Eosinophils	0 %
Large lymphocytes ..	22 %	Basophils	0 %

Arneth count impossible. Red cells appear normal.

As supplies of *pentose nucleotide were not* immediately available, sodium nucleinate in doses of gr. ¾ were administered intramuscularly at four-hourly intervals. On May 27th (after 12 doses of sodium nucleinate) the total leucocyte count gave a figure of 2813 per c.mm. and the differential count was as follows:—

Polynuclears	51 %	Eosinophils	0 %
Small lymphocytes ..	16·5 %	Basophils	0 %
Large lymphocytes ..	23·0 %	Myelocytes	6·0 %
Transitionals	3·5 %		

	Class— 1	2	3	4	5
Arneth count	61 %	29 %	7 %	2 %	1 %
Arneth index	93·5 %				

Red cells show early anæmia. Several normoblasts seen.

These results, however, did not appear to coincide with any improvement in the general condition of the patient who rapidly became worse and died on May 28th. *Pentose nucleotide* injections in 10 c.cm. doses had been commenced on the previous day. Unfortunately, it was not possible to carry out a *post-mortem* examination.

We are unable to obtain any evidence in this case of a previous ingestion of amidopyrin as an exciting cause. There was, however, an obvious focal infection of dental origin. It is doubtful if an earlier administration of pentose nucleotide would have affected the ultimate issue of an acute fulminating case such as this, with a total leucocyte count below 1000.

I am indebted to Prof. I. Walker Hall for the blood counts and examination of the films.

RIGHT-SIDED EVENTRATION OF THE DIAPHRAGM

WITH NOTES ON A CASE

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Eventration was first recognised as an entity by Jean Louis Petit (1674–1750). The reports that followed his description were sporadic, but of late years interest in the condition has revived. Writing in 1923 Morison[1] defined it as follows: "It is generally accepted that the term Eventration Diaphragmatica should be applied to those cases of congenital origin in which there is a diffuse relaxation of one-half of the diaphragm, so that it extends high up into the thorax forming a sac. . . ." He himself reporting six left-sided cases stated that all those hitherto recorded, except Eppinger's,[2] have likewise been on the left side. This is not strictly correct, however, because Hamdi[3] published a right-sided case in 1905; the eventration occurred in a man of 50 and contained stomach and liver. There is also a third case described by Bayne-Jones[4] in 1916 in a man of 52. Here the clinical diagnosis was confirmed at operation: the dome of the right side of the diaphragm reached the third rib in front and showed paradoxical movements; the liver was high up in the chest.

Wessler and Jaches[5] mention a case of eventration in which distended coils of colon occupied most of the right side of the chest; at operation the right side of the diaphragm was found intact but atrophied. They state that in right-sided eventration the liver is displaced downwards.

Golob[6] records a case of asymptomatic right-sided eventration discovered on routine examination in a man of 57 suffering from carcinoma of the œsophagus.

Upensky's[7] three cases occurred in women, aged 19, 25, and 31 respectively. They all showed paradoxical movements of the diaphragm. He draws attention to the great difficulty in differentiating right-sided eventration from right-sided diaphragmatic hernia.

Morris's[8] case is interesting because transposition of abdominal viscera was present in addition to right-sided eventration.

The following case, which, for reasons set out below, we regard as one of right-sided eventration, is the ninth recorded.

CASE REPORT

The patient is a woman of 57, single. Nothing of interest in the family history. Very delicate since birth, and in early infancy her life was often despaired of. In 1908 while planting flowers in the garden she experienced a sudden severe pain in the right side of the chest. Thought to have pleurisy and explored with a needle several times, with negative results. Dr. Samuel Gee was called in and pronounced the condition to be one of congenital atelectasis. Patient states that she always has a feeling under right arm "as if something were there" and that she is tender in that spot. Never cyanosed, but always tended to get out of breath on going upstairs. She has been an invalid for several years on account of rheumatoid arthritis. She was recently treated for "depression" at the Woodside Hospital. An abdominal tumour, which eventually turned out to be the liver, was discovered there, and she was transferred to the Middlesex for further investigations.

Appetite good. No abdominal pain. No constipation or diarrhœa. The only evidence of digestive disturbance are slight flatulence and occasional morning vomiting. She complained of cough recently and a slight hæmoptysis occurred seven months ago.

Examination.—Colour fair. No clubbing of fingers. Heart regular; apex-beat in fifth space, in nipple line; soft systolic murmur at apex; second aortic sound accentuated. B.P. 180/110. Diminished movements on the right side of the chest. Tactile fremitus absent at the right base. Lower half of right thorax dull to percussion. No breath sounds heard over dull area, but occasional gurgling is plainly audible, especially after taking liquids by mouth. Above, the breath sounds are poor and a few crepitations are heard, but air entry fair at right apex. Lower edge of liver felt in right iliac fossa. Central nervous system: nil abnormal found. *Joints*: typical changes of rheumatoid arthritis.

RADIOGRAPHIC FINDINGS

Chest.—A dense shadow obscuring the detail of lung and other structures was seen to occupy the middle and lower zones of the right lung. The upper border of the shadow was convex and peaked in one place, suggesting the possibility of an adhesion. The rest of the lung fields appeared clear, and the heart and the mediastinal contents showed no displacement (Fig. 1). The absence of lung markings over the affected part and the lack of mediastinal displacement confirmed the clinical findings of atelectasis of the right middle and lower lobes. In the lateral view (Fig. 2) in the upright position, the left side of the diaphragm was well outlined and normally placed, and the upper border of the shadow noted on the right side in the anterior-posterior view was seen to be dome-shaped and reaching the level of anterior part of the second rib (Fig. 2). The movements of the upper border of the shadow on the right were poor but synchronous with those of the left side of the diaphragm.

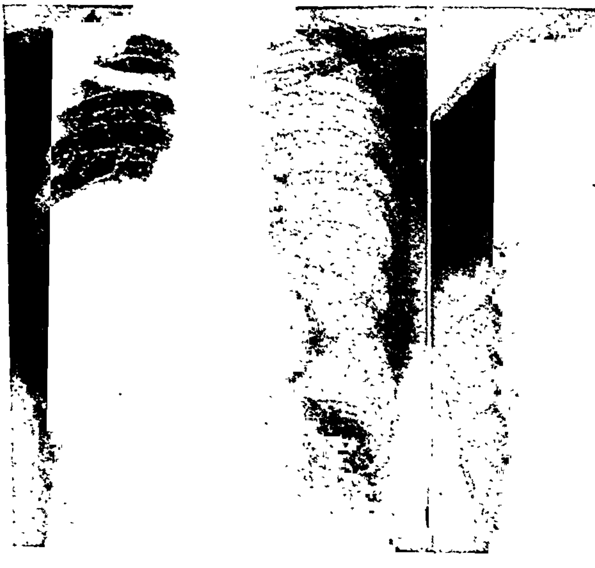

FIG. 1.—A.P. view of chest showing marked elevation of the right side of the diaphragm.

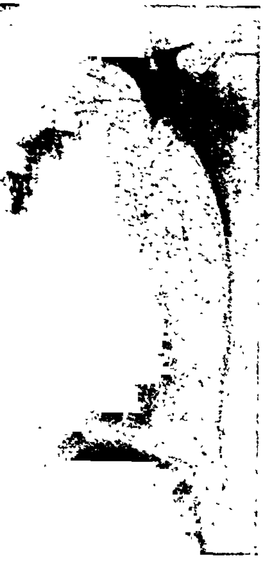

FIG. 2.—A lateral view showing both sides of the diaphragm.

Opaque meal examination.—The œsophagus was normal in length, position, and function. The stomach showed no abnormality apart from its low position and slight dilatation, the lower part of its greater curve being 2 in. below the level of the iliac crest. The duodenal cap was found stretched out, pointing upwards towards the right side of the chest. In the upright position the stomach had great difficulty in expelling the meal through the cap, and barium was seen passing upwards in a very narrow stream making a small loop before entering the right side of the chest. No constricting point was noticed (Fig. 3). In the lying position the stomach emptied with greater ease and coils of small intestine were soon outlined in the right side of the chest. Further passage of the meal demonstrated that not only the small gut, but also the cæcum and most of the colon were in the right thorax.

An opaque enema confirmed the barium meal findings as regards the colon and showed its intra-abdominal part extending obliquely from the right side of the chest to the rectum. The length of the intra-abdominal part of the colon was approximately 12 in. (Fig. 4).

It is interesting to note that despite the abnormal position of most of the gut the examination revealed no gross disturbance of function. The stomach took over five hours to empty, as was to be expected from the extent of its dilatation and the degree of stretching of the duodenum. There was no delay in the passage of the meal through the small intestine and at five hours both the intrathoracic and intra-abdominal parts of the colon were outlined. At 24 hours the small intestine was empty, but at 48 hours a residue of barium was still present throughout the colon.

Position of the other viscera.—The lower border of the *liver* extended to the middle of the sacrum; its upper border could not be traced definitely and only a little of the liver shadow was seen to the left of the spine. A cholecystographic examination showed the *gall-bladder* lying over the middle of the body of the sacrum; it functioned normally. The *spleen* was situated in its normal position under the left cupola of the diaphragm. Both *kidneys* were well outlined after an injection of Uroselectam. The left kidney was slightly low in position, its pelvis being opposite the body of the second lumbar vertebra; the right kidney was high, its pelvis being opposite the body of the twelfth dorsal vertebra, but it was clearly within the abdomen.

DIAGNOSIS

There are many problems in the diagnosis of diaphragmatic abnormalities. Clinical examination alone offers little help, and unaided by X rays would often fail to discover the presence of such lesions; but even X rays may leave the issue unsettled and such methods as inducing a pneumoperitoneum or measuring variations in intragastric pressure may have to be resorted to before a definite diagnosis is arrived at. Our case was fortunately sufficiently clear-cut for us to be able to dispense with these procedures.

The literature is full of conflicting statements as regards movements of the diaphragm in eventration; some authors like Morison[1] affirm that paradoxical movements are always present in the absence of adhesions, others that the diaphragm is motionless, while others again maintain that the movements are synchronous. Our case supports the third contention.

Wood and Wood[9] point out that care must be taken to distinguish congenital eventration from (1) those intra-abdominal conditions where the diaphragm is pushed up, as in ascites, pregnancy, subphrenic abscess, and megalocolon; or (2) such lung conditions as fibroid phthisis, atelectasis, or neoplasm which may cause the diaphragm to be pulled up; or (3) cases of paralysis of the phrenic nerve from disease, trauma, or operation; or (4) temporary elevation due to trauma.

It must be realised, however, that the distinction between congenital eventration and the acquired condition may be exceedingly difficult or even impossible, and that in either case the final state of the diaphragm may be identical—that is, it may present a sheet of thinned and stretched-out fibrous and areolar tissue with few or no muscle-fibres.

In the differential diagnosis of our case we considered: (1) paralysis of the diaphragm, (2) eventration, (3) hernia, and (4) absence of the right half of diaphragm. The negative history, radiographic and clinical findings ruled out the first, and the radiogram showing an unbroken dome of the right sid[illegible] eliminated the third and fourth [illegible] were left with the diagnosis of the rare condition of right-sided eventration and were forced to conclude that it was of congenital origin as we were able to eliminate the other possible causes of high diaphragm.

Our case offers a warning against indiscriminate needling of the chest in obscure cases, because unless eventration or hernia of the diaphragm have been eliminated there is a great danger of perforating a viscus.

TREATMENT

Thoracic surgery has made sufficient advances to tackle successfully many cases of diaphragmatic hernia, but eventration, as far as one can see, is not properly amenable to surgical interference; and even if it were possible in the case here reported, one would still hesitate to advise it since the condition gives rise to

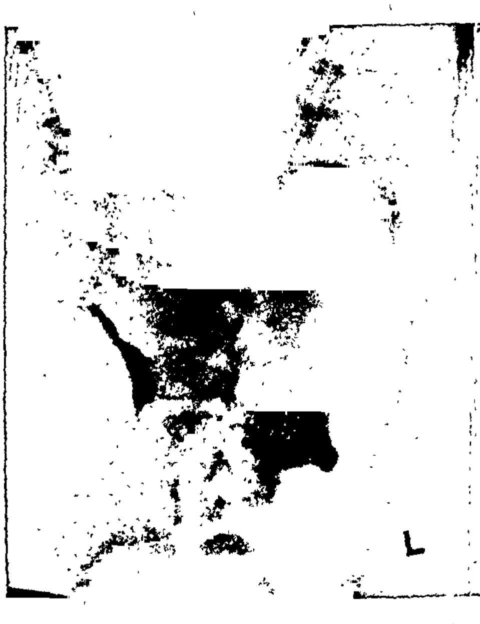

FIG. 3.—This shows the stomach and the stretched-out duodenum; the small intestine is seen in the right side of the thorax.

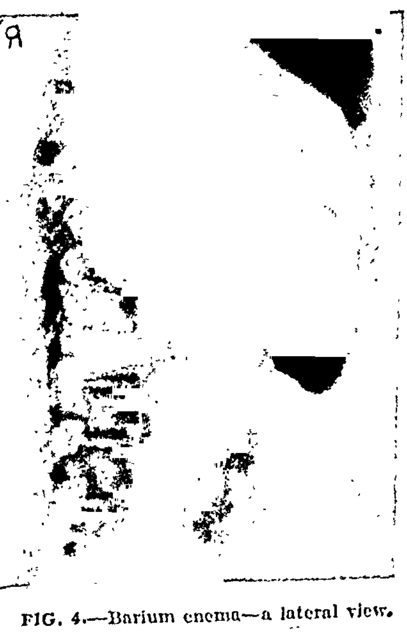

FIG. 4.—Barium enema—a lateral view.

hardly any symptoms and the likelihood of serious disability in the future appears remote.

It is a pleasure to thank Dr. C. E. Lakin and Dr. W. R. Gilmour for their permission to publish this case.

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A CASE OF ACETYLSALICYLIC ACID (ASPIRIN) POISONING

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FEW cases of poisoning by acetylsalicylic acid (aspirin) have been reported in this country. Sir William Willcox[1] though including its consideration in a lecture on "toxic drugs," has lately placed upon record the opinion that aspirin is "one of the most valuable and safe of simple remedies." The last case of acetylsalicylic acid poisoning placed on record in this country appears to have been that reported by Hitch[2] in 1928; in this case death occurred after a dose of grs. 1000; in the same year, Jankovich[3] from Paris recorded five fatal cases; he formed the opinion that the fatal dose was in the neighbourhood of grs. 300. More recently, Balázs,[4] writing from Budapest, where the taking of acetylsalicylic acid appears to be a favourite method of attempting suicide, has reported on 752 cases of which, however, only 4 proved fatal. Balâzs considers the minimum fatal dose to be in the neighbourhood of 30 to 40 g. (grs. 450 to 600).

The case here reported ended in recovery; the dose so far as could be ascertained was grs. 435. Inasmuch as on first being seen the patient was in a stuporous condition and quite unable to give any assistance, and as there was nothing in the circumstances of the case to indicate the nature of the trouble it presented a very pretty diagnostic exercise.

CASE RECORD

The patient was a woman, aged 26; she supported herself, and was living in lodgings, both parents being dead; as she was a newcomer to the locality she had no friends or intimates who could give any information likely to throw light on the case.

She was first seen by Dr. D. M. Brown on March 6th, when she complained of buzzing in the ears and nausea; there was no vomiting; temperature 99 and pulse-rate 100. She remained much the same until the evening, when she became deaf and started to wander; she was restless and disoriented all night, and when seen on the morning of March 7th was in a stuporous state with symptoms suggestive of cerebral irritation.

Through the courtesy of Dr. Brown a specimen of urine was made available for examination before the patient was seen by myself. This showed a certain amount of reduction of Fehling's solution, a large amount of acetone, some albumin, and gave a very strong purple colour with aqueous perchloride of iron. Although the amount of acetone present was large, the depth of colour given by the perchloride of iron was much in excess of that met with even in severe ketosis; inquiry at the time elicited the fact that the patient had been given no salicylates by her doctor.

When first seen, the patient was lying with her head buried under the bed clothes; she was unable to answer questions or to speak rationally, and on being disturbed showed resentment and became extremely restless; she was very thin and appeared extremely dehydrated; all reflexes were present and normal; the eye grounds showed no abnormality; Kernig's sign was absent and there was no neck rigidity; temperature was just under 100° F. Respirations were deep and slow and of the type met with in severe "acidosis."

No diagnosis was made; a sample of blood was taken for examination and the removal of the patient to a nursing-home arranged. The blood showed no leucocytosis (white cells 3500 per c.mm.), and films presented no abnormalities; blood-sugar was 0·112 and urea 0·054 per cent.; quantitative examination of the urine showed the reduction to be the equivalent of only 0·35 per cent of glucose. These examinations served to exclude diabetes, uræmia, or an acute bacterial infection as the cause of the trouble, but failed to establish any definite diagnosis.

The immediate indications appeared to be to correct the dehydration and the ketosis, and on admission of the patient to the nursing-home, instructions were given to empty the bowel by enema and to administer 5 per cent. glucose in saline by the rectum and fruit juice and glucose by mouth. The parenteral administration of fluid and glucose was withheld until it could be seen whether the patient would retain fluids administered orally.

Seen in the evening of the same day the condition remained much the same and the diagnosis still in doubt. Lumbar puncture was performed; only a local anæsthetic was used and the patient appeared unconscious of what was going on. The cerebro-spinal fluid was under a pressure of 180 mm. of water; it was allowed to flow until it had fallen to 120 mm. On examination the fluid showed a great deal of acetone to Rothera's test, and gave a strong purple colour with the perchloride of iron; there was no increase of cells or of globulin or albumin, and chlorides were present in normal amount.

The condition improved strikingly after the lumbar puncture; the patient spent a quieter night and in the morning, although semistuporous, appeared better; the hyperpnœa was passing off; she had taken fluids readily throughout the night, there had been no vomiting, and she appeared much less dehydrated. Irregular pyrexia of from 99° to 101° continued. The Rothera reaction of the urine was less deep, but the perchloride of iron reaction remained strong. The urine now also showed bile salts in large amount and a trace of urobilin.

The mental conditon with the pyrexia had given rise to suspicion of some form of infective encephalitis; the normal cytology and the absence of increase in the proteins of the cerebro-spinal fluid served to render this diagnosis unlikely. In the light of the evidence then to hand the case was evidently one of severe metabolic disturbance, due to some poison; diabetes and uræmia had been excluded and no other likelihood of endogenous poisoning presented itself; of exogenous poisons acetylsalicylic acid or some combination of it with a barbiturate appeared possibilities. The cerebro-spinal fluid was tested for the barbiturates with negative results, and a tentative diagnosis of aspirin poisoning was then made.

Lumbar puncture was repeated; the pressure of the fluid was now only 140 mm. It was drained until it fell to 110. The fluid showed a trace of acetone but still gave an intense reaction with perchloride of iron though the colour was less deep than in the previous day's specimen.

On the third day the patient was physically a great deal better; the mental condition remained dull and stuporous and she was still quite unable to talk rationally or to give any account of herself. By this time relatives were on the scene, and with their assistance a search of the patient's room was made; the only relevant article discovered was a bottle which had originally contained 100 5-grain tablets of acetylsalicylic acid, and in which 12 tablets still remained. This was regarded as favouring the diagnosis of acetylsalicylic acid poisoning.

Throughout the first three days of the illness, while mentally dull and stuporous, the patient displayed occasional fits of extreme restlessness especially if disturbed; during these spasms certain movements were regularly repeated; sometimes she raised herself in bed and bringing the hands to within about a foot of the head made movements as though endeavouring to stroke the scalp, but unable to bring the hands any nearer to it; a further series of movements repeated at intervals were identifiable as being associated with certain frequently repeated movements involved in the work by which she earned her livelihood. The condition improved rapidly after the second lumbar puncture, and on the fourth day she was able to hold rational conversation. She complained that her head felt enormously large; this apparently explained the curious stroking movements referred to in the previous paragraph; she further complained of disturbance of vision, stating that everything looked streaked and barred.

An attempt was now made to ascertain from the patient the cause of the trouble; when shown the bottle containing the acetylsalicylic tablets, she at once recognised it as her property and volunteered that she had taken one tablet from it though not for her own use; she inquired where all the missing tablets had gone, and stoutly denied having consciously taken any of them herself. She was unable to account for the missing 87 tablets, and finally admitted that she must herself have taken them. She persisted in her denial of any recollection of having done so.

Inquiry of the relatives elicited a history of peculiar "turns" diagnosed in the past as "petit mal," and it seemed probable that the patient had consumed the tablets while in a somnambulistic state. The patient was seen by myself after this; I am informed by Dr. Brown that she made a good recovery and in about a month was entirely herself again.

COMMENT

Apart from the diagnosis the interest in this case lies in the type of the clinical manifestations; these pointed to a profound disturbance of metabolism, and to toxæmia with a heavy incidence on the higher nervous centres. In the early stages the extreme hyperpnœa was a marked feature; Quincke[5] noted this as one of the symptoms of salicylic acid poisoning; he regarded it as being due to the direct action of the acid radicle of the compound on the respiratory centre and called it "Salizyldyspnœ" Balázs points out that in acetylsalicylic acid poisoning, this hyperpnœa appears only when acetone is present in the urine, and when a state of so-called acidosis has been established. He regards it as being due to the action of the acid substance released as a result of the disturbed metabolism and not directly to the acid radicle of the salicylic acid. He investigated the alkali reserve in several of his patients and found that in extreme cases it might fall to between 30 and 40 per cent. If the hyperpnœa were due to actual liberation of acid radicles from the ingested compound, it might have been supposed that the urine would be strongly acid; in the present case the urinary pH was found to range from 5·8 to 6·4, which is not unduly to the acid side.

Evidence of the widespread nature of the toxæmia was afforded in this case by the urine which showed (in addition to acetone) bile salts, albumin, and granular casts; these findings made it evident that both liver and kidneys were severely damaged. Albumin was present at first in large amount, and at the last observation on the fifth day was still present in traces; bile salts remained present in fair amount throughout the period of observation.

The temperature ranged during the first four days from normal to 101°; it settled on the fifth day; about a week later, I am informed by Dr. Brown, it again rose and remained up for several days; no physical signs indicative of inflammatory trouble accountable for the pyrexia could be found. Balázs noted similar pyrexia in several of his cases; he regards it as being due to a disturbance of the cerebral heat-regulating centre.

Treatment.—Even in the absence of a diagnosis, the obvious indications in this case were from the onset to correct the dehydration, to combat the acidosis, and to support the liver against further damage. To this end, as mentioned above, glucose-containing fluids were pushed in every possible way. The question of the exhibition of insulin was considered but the normal blood-sugar level was regarded as a contra-indication; Balázs found it of no service. As a means of combating the ketosis he recommends the administration of sodium bicarbonate both enterally and parenterally; in my experience, sodium bicarbonate is of little value in combating the ketosis of diabetic coma, and was accordingly not used in this case.

The beneficial effect of lumbar puncture was striking; on both occasions on which it was performed it was followed by a sudden and definite improvement in the general condition. The very strong reaction with ferric chloride given on both occasions by the cerebro-spinal fluid would indicate the presence in it of large amounts of the drug, and it is reasonable to suppose that benefit was due to removal from contact with the central nervous system of fluid saturated with the noxa. The beneficial effect of drainage of the cerebro-spinal fluid in this case of acetylsalicylic acid poisoning is in conformance with general experience in barbiturate poisoning in which also the noxa is taken up in large amount by the fluid.

SUMMARY

A case of poisoning by acetylsalicylic acid is described. The dose was 435 grains; the symptoms were those of profound toxæmia with evidence of hepatic, renal, and cerebral damage; symptoms referable to the alimentary tract were absent; lumbar puncture was beneficial; recovery ensued.

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PAPILLŒDEMA CAUSED BY A CERVICAL CORD TUMOUR

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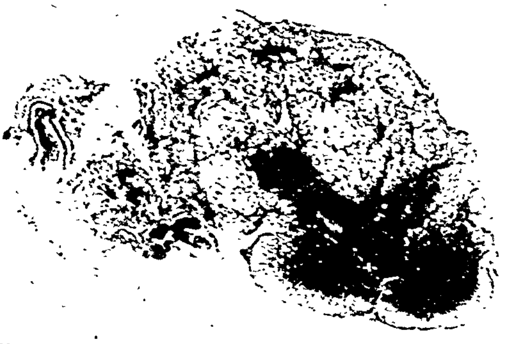
THE occurrence of papillœdema with a tumour of the cervical cord has been so seldom reported that the following case seemed worth recording:—

A woman, aged 20, was admitted to Middlesex Hospital on July 20th, 1934. She said that she had been in good health until June, 1932, when she noticed an aching pain in the left occipital region; soon afterwards the neck became stiff, so that she had difficulty in turning her head to the left or bending it backwards. In December, 1932, she experienced pain in the right shoulder and down the outer side of the right arm; these pains were aggravated by coughing and sneezing. A few months later similar pains were felt in the left arm. In January, 1934, she was admitted to a hospital on the south coast because the pain in the neck had become increasingly severe. During her stay in this hospital she had attacks of nausea without vomiting but accompanied by moderate headache. At no time did she notice any weakness of her arms or her legs. On April 29th, 1934, her neck was manipulated for a supposed torticollis. On coming round from the anæsthetic she noticed that the left leg had become stiff and weak; seven days later the right leg was similarly affected; she also found that the movement of the head was further limited. The pain in the back of the neck became more severe and was accompanied by frontal headache and nausea. Before the manipulation she had experienced slight difficulty in starting micturition but afterwards she had retention followed by incontinence.

Examination.—Mentally the patient was alert and coöperated well. She was unable to lie flat in bed because extension of the head caused pain. The head was constantly flexed to the right, but without any definite rotation. Suboccipital tenderness was noted especially on the left side. Pupils equal and reacted normally. No ptosis. Ocular movements full. Inconstant nystagmus. Approximately 3 D. of papillœdema was present. Corneal reflexes brisk. No sensory loss on face. No facial weakness. No deafness. Remaining cranial nerves normal. *Upper limbs.* No wasting. Power at all joints both arms good. No abnormal posture. Reflexes present and equal with the exception of a diminished left triceps jerk. No cerebellar signs. *Lower limbs.* Total paraplegia: right leg in extension; left leg in mild flexion. Deep reflexes exaggerated. Plantar responses extensor. Strong tendency to involuntary flexor spasm. *Sensation.* Hyperæsthesia on outer aspect of both arms as high as the shoulder. All forms of sensation diminished on inner aspect of both upper arms as far down as the elbow. Postural sense, stereognosis, and compass test normal in both hands. All forms of sensation much diminished on trunk and lower limbs up to the level of D. 2 segment. Complete postural loss of the toes of both feet. Incontinence of urine.



Section of the tumour at the seventh cervical segment.

The patient showed no sign of active tuberculosis in chest, and no enlargement of superficial or of mediastinal glands. The liver and spleen were not enlarged. The cerebro-spinal fluid (lumbar route) had an initial pressure of 100 mm. water, which on jugular compression rose to 140 mm.; the descent was slower than normal. The fluid was yellow with rapid clotting and contained protein 1·78 per cent. Cisternal puncture showed an initial pressure of 305 mm. water, with slightly yellowish fluid containing protein 0·18 per cent. Radiography of skull and spine revealed no abnormality.

Pre-operative diagnosis.—The history suggested a mid-cervical tumour. The highest limit of sensory loss appeared to be at the level of D. 1; but there was hyperæsthesia as high as C. 5. There was no definite evidence, from the history or the signs, of a primary posterior fossa tumour. The clinical picture could be explained by a high cervical tumour of considerable length which had penetrated the foramen magnum and so caused an increase in intracranial pressure. However, one would have expected a tumour in this situation to have caused weakness in the arms. The possibility of two tumours had to be borne in mind, one in the posterior fossa and one in the cervical region. An intramedullary rather than an extramedullary tumour of the cervical cord on the whole seemed the likeliest diagnosis. The patient was transferred to the Hospital for Epilepsy and Paralysis, Maida Vale, and was operated upon by Mr. Charles Donald on August 24th. The laminectomy extended from C. 1 to C. 5, and later the edge of the foramen magnum was also removed. A marked bulging of the dura was apparent which, when opened, showed the cord much enlarged by a tumour which was partially extramedullary and involved the cord itself. The cord was swollen from just below the foramen magnum to beyond the lower limit of the wound. A piece of tumour was removed which proved to be a glioma. Subsequently the papillœdema subsided somewhat. A month after the operation the motor power of the upper limbs was still unimpaired; however, the patient developed bedsores and had attacks of respiratory embarrassment, one of which proved fatal on Oct. 2nd.

Post-mortem.—An elongated tumour was found, partly extramedullary and partly intramedullary, extending from C. 1 segment to approximately D. 1 segment. It lay posteriorly, and chiefly on the right side of the cord. The surface was irregular and soft. Serial sections showed that the tumour was mainly extramedullary at the level of C. 1 to C. 3, and below this level invaded the cord. The intramedullary portion was confined to the dorsal half of the cord. At the level of segments C. 6 to C. 8 it reached its maximum width. No cerebral tumour was found; there was a moderate bilateral hydrocephalus.

DISCUSSION

The association of papillœdema with a cervical tumour is extremely rare. No attempt has been made to make a full search for isolated cases, but Elsberg,[1] in his well-known book on "Tumours of the Spinal Cord," makes no mention of papillœdema in dealing with tumours situated in this region. Elsberg and Strauss [2] in 1929 reported five cases of high cervical tumour, in which the tumour lay both within the vertebral canal and the posterior cranial fossa, and papillœdema was absent in all of them. In each one the tumour was circumscribed and its removal was possible. Carlill and Carling [3] have reported a case very similar to the present one.

A female, aged 41, experienced pain in the left arm followed by weakness in this limb and later weakness and numbness in the legs. Three months after the onset headaches became marked; three dioptres of papillœdema was present on the right side and a hæmorrhage was seen around the left disc. There was atrophy of the intrinsic muscles of both hands, a spastic paraplegia, and a dissociated type of anæsthesia on the trunk and right leg. The cerebro-spinal fluid by the lumbar route showed 0·6 per cent. albumin and by cisternal puncture 0·01 per cent. Lipiodol was held up opposite the fifth cervical spine. A cervical laminectomy disclosed a uniformly enlarged cervical cord that did not pulsate; papillœdema rapidly subsided after the operation. Attacks of unconsciousness, relieved at first by cisternal puncture, followed, but the patient died a month after the operation. Post mortem the tumour was found to extend to the base of the brain. There was moderate internal hydrocephalus.

Davis [4] showed a similar case before the New York Neurological Society in 1923.

A male, aged 24, for two years had suffered from headache, dizziness, and vomiting. Subsequently he improved but showed slight papillœdema, diminution of the deep reflexes in the arms, and a left extensor plantar response. No sensory changes were found. The cerebro-spinal fluid findings were negative but no mention is made of the protein percentage. Two months later he showed weakness and atrophy of the arms and hands and sensory loss between segments C. 3 and D. 1. On one occasion he had a generalised convulsion without loss of consciousness. A mid-cervical laminectomy disclosed a cord completely filling the dural cavity with an apparent lack of fluid below level of segment C. 4. At this level an intramedullary cavity was disclosed. The papillœdema subsided. In this case the tumour was evidently a diffuse *intramedullary tumour of the cervical cord possibly associated with syringomyelia.*

Papillœdema very rarely occurs in syringomyelia. Alpers and Comroe,[5] however, have described such a case in which there was much papillœdema which led to the consideration of a cerebral tumour in addition to the cord condition. A subtemporal decompression was performed but the patient died shortly afterwards. In addition to cervico-dorsal syringomyelia a marked degree of hydrocephalus was present which the authors considered was due to an inflammatory process of the roof of the fourth ventricle extending into the lateral recesses which had probably blocked the foramen of Magendie and Luschka. They referred to other four cases of syringomyelia showing papillœdema; in two of these there was much internal hydrocephalus, the cause of which was not determined. In one case there was a tumour of the fourth ventricle. In the remaining cases only clinical data were available.

The cause of the papillœdema in the present case is not clear. The tumour did not extend into the foramen magnum. The cord was uniformly enlarged and it filled the subdural space at the level of the lower cervical segments. It should be noted that the protein content of the cerebro-spinal fluid, obtained by cisternal puncture, was high. Theoretically a high cervical tumour extending through the foramen magnum into the posterior fossa, or vice versa, might be expected to produce papillœdema more readily than a tumour confined to the cervical cord. Clinically, however, this seldom occurs except possibly in isolated cases. It is probable that with a circumscribed tumour such as is most frequently met with in this situation the block is not complete; on the other hand, a diffuse glioma of the cervical cord leads to a uniform enlargement and the block is greater, even if the tumour does not actually extend into the foramen magnum. It would be unwise to speculate further from such limited material on the actual cause of the papillœdema in these cases. Three points, however, suggest themselves for consideration. Firstly, in each of the three cases referred to the tumour of the cervical cord was a diffuse one; secondly, in two of the cases the maximum growth of the tumour had not occurred at the uppermost level of the cervical cord; thirdly, the tumour tends to fill the whole subdural space at its maximum point of growth.

It has to be borne in mind that cerebral gliomas are occasionally associated with metastases in the spinal cord.[6] The commonest variety of glioma to metastasise in this way is the medulloblastoma, the favourite seat of which is the cerebellum. Confusion might therefore arise between the type of case reported in this paper and a medulloblastoma of the cerebellum with a secondary deposit in the cervical cord. Nystagmus might occur in both conditions. However, in addition to a careful history, which would probably indicate the initial site of the tumour, the medulloblastoma would declare itself by the presence of cerebellar signs.

Another feature of interest in the present case is the absence of paresis in the upper limbs despite the involvement of the whole of the cervical enlargement by tumour. Perhaps this may be explained by the dorsal situation of the tumour, but it is well known that diffuse glioma of other parts of the nervous system, particularly of the brain-stem, may cause remarkably few focal signs.

SUMMARY

1. A case of diffuse glioma of the cervical cord associated with papillœdema is described, and two other similar cases are referred to. Certain deductions are made as to the conditions necessary for this association.

2. The case is also noteworthy because of the retention of motor power in the arms.

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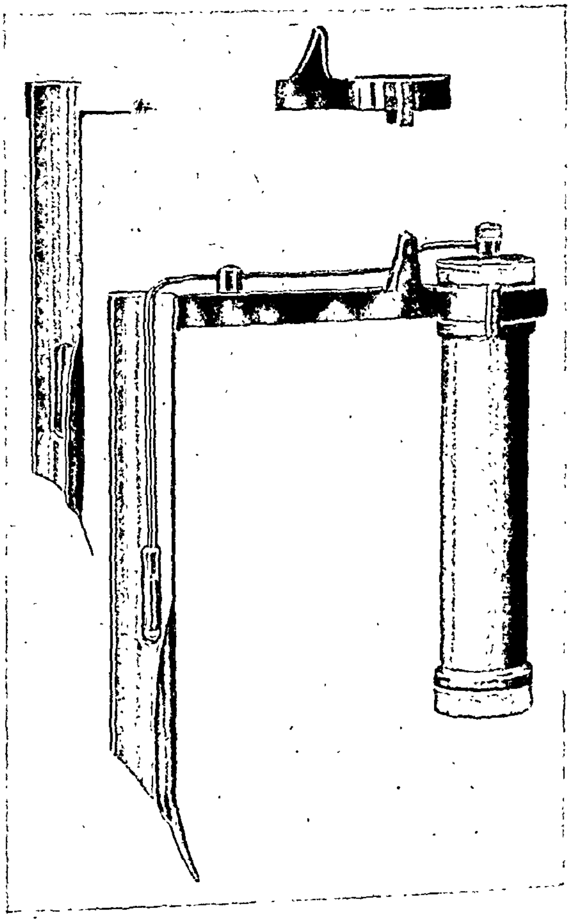
6. Russell, D. S., and Cairns, H.: Jour. Path. and Bact., 1930, xxxiii., 383.

NEW INVENTIONS

A DETACHABLE LARYNGOSCOPE

It has appeared to me undesirable to boil the part of the laryngoscope which contains the electrical equipment so I have had this part made detachable. A smaller mouth-piece is also made which can be fitted on to the handle of the apparatus for use with children. The actual tube of the laryngoscope is made flatter on the upper side so that the tongue is kept more out of the way and it is easier, by means of an introducer, to pick up a tube introduced through the nose and push this through the cords.



The laryngoscope has been made for me by the Dental Manufacturing Company, London.

JOHN ELAM, M.R.C.S.

REVIEWS AND NOTICES OF BOOKS

The Subnormal Mind

By Cyril Burt, Professor of Psychology, University of London. London: Humphrey Milford, Oxford University Press. 1935. Pp. 368. 10*s.* 6*d.*

Whatever comes from the pen of Prof. Burt is assured of scientific detachment and clear exposition. When some years ago he published the "Young Delinquent" he established himself as more than an academic psychologist, as one who could give at once a sympathetic and scientific account of human problems. In this book he maintains the same humanistic spirit; his work in mental tests has always shown a devotion to accuracy in method and deduction. The book is important in that it gives a clear account of the psychology of mental defect and dullness, and of the methods for their assessment and the educational manner of handling them. The chapter on delinquency is a lucid résumé of the author's earlier volume, but the chapters on the neuroses are new in matter and in method of exposition. Dr. Burt clearly distinguishes between asthenic and sthenic neuroses; in the former group he places the exhaustion states usually described as neurasthenia and some anxiety states. The asthenic neuroses are largely physical in origin; whereas sthenic neuroses are mainly psychical. Inasmuch as he is largely concerned with the conditions in children he does not fall back upon the deep layers of the unconscious for explanation. The history is briefer in such child cases and the psychic patterns less complex. While frankly sympathetic towards psycho-analysis, he does not hinder the reader with the more recondite psychoanalytic explanations, although it is to be assumed that he could accept in the main the Freudian psychology. Among the sthenic neuroses he places the hysterical group, compulsions, obsessions, and anger neuroses—in fact, the behaviour disorders. All these conditions call for social handling and psychotherapeusis from encouragement and suggestion to full psycho-analysis. It would be difficult to think of a book in which mental defect and psychoneuroses have been more clearly and accurately described in simple language, and most medical men, including specialists and general physicians, would be the wiser for studying this readable volume.

Annual Review of Biochemistry

Vol. IV. Edited by James Murray Luck, Stanford University. California: Annual Review of Biochemistry Ltd. 1935. Pp. 639. $5.

The appearance of each new volume of this annual review is anxiously awaited by workers in laboratories. This year there are many changes in the personnel of contributors, sometimes, but by no means always, for the better. Some of the articles are of especial interest. The section on Biological Oxidations and Reductions by R. Sonderhoff is excellent, giving a good summary of the present position of this ever-changing subject. The recent investigations of Wieland on the dehydrogenases of yeast are very clearly described, and the work of Szent-Györgyi and others on muscle dehydrogenase is noted. The section closes with a succinct summary of the relationship between Warburg's yellow enzyme and the flavins. Recent work on carbohydrates and glucosides by Sir J. C. Irvine and G. J. Robertson is also summarised, with a good review of the work that has lead to the establishing of formulæ for some of the disaccharides and polysaccharides. The Chemistry and Metabolism of the Compounds of Sulphur by H. B. Lewis is a particularly valuable contribution which will be much appreciated. The section on the hormones by B. A. Houssay is disappointing in that recent developments, particularly with regard to the sex hormones, are not described at all clearly. B. E. Holmes's article on malignant disease is a useful addition to the book, but we would have liked to have seen a fuller discussion of the relationship between certain sex hormones and malignant disease. One of the most interesting sections in the book is Robert Robertson's summary of the present position of knowledge with regard to the chemistry of the alkaloids.

The work as a whole is quite up to the excellent standard of the three previous issues, and is therefore necessary to all biological workers.

Public Ill Health

By C. E. McNally, Hon. Treasurer, Committee Against Malnutrition. London: Victor Gollancz Ltd. 1935. Pp. 224. 5*s.*

This is a provocative book and is intended to provoke. The author is as angry as Jonah was when the Almighty called upon him to denounce Nineveh and afterwards relented. Mr. McNally is exceedingly displeased with Sir George Newman for what he regards as his official tolerance of widespread physical deterioration. Where the truth about the prevalence of malnutrition lies between the late C.M.O.'s apparent optimism and the author's extreme pessimism cannot be determined so long as there is no accepted objective standard. Mr. McNally's chapters are a useful contribution to the study of malnutrition, but he is, we think, under some misconception as to the functions of an officer of the Ministry of Health. Whatever his personal views may be, a civil servant can hardly express criticism of "the whole economic structure of the milk market" or the restriction on the import of foods.

The personal issue apart, there can be no quarrel with the author's main thesis of the association of disease and poverty. Some criticism is possible of certain points: thus the failure of young adult life to respond to the fall in the tuberculosis death-rate is a widespread phenomenon not limited to depressed areas, and is a puzzle to tuberculosis experts, nor is close association proved between maternal mortality and malnutrition, witness the statement in the Scottish report, "Scrutiny fails to reveal that lack of food was a factor in maternal mortality." But that large numbers of our people live under economic and social conditions under which optimum health is difficult or impossible of attainment will not be disputed, and it is well that this should be set forth with a reformer's zeal. The main subject dealt with in this respect is diet. There are useful chapters on food values and requirements, and justifiably caustic comment on the economics which permit the wholesale destruction of food-supplies while populations lack the necessities: there is also sympathetic understanding of the difficulties, too seldom appreciated, which encumber the housewife living in poor property. We have thus on the one hand an insistence on the B.M.A. dietary standard as a minimum, and on the other hand emphasis on the impossibility of attainment of this minimum by a large section of the population. Hence in the author's view ill-nutrition is inevitable.

The problem is not primarily medical but economic.

How his laudable desire that every family should have sufficient purchasing power to obtain more than the B.M.A. minimum is to be fulfilled the author does not indicate: it is unfortunately at present beyond attainment by many wage-earners. There are many counsellors in the market place—communism, social credit, birth control, return to the land, restriction of imports, freedom of trade: there is no certain guide to the promised land and the author does not help us here. Few would, however, dispute that the condition of our people is better than formerly, and even the author admits this as regards school-children, though he qualifies his statement by the words "as reflected by the look of the children." We have travelled far since the Report on the Sanitary Condition of the Labouring Population of Great Britain in 1842, which initiated the public health movement and doubtless will travel further. But progress hitherto made is no ground for complacency, an attitude which this book will help to combat. It is probable that the next orientation of public health will be in the direction of nutrition, with an increasing recognition of its importance and the filtering through to the general population of the scientific knowledge now available. Mr. McNally's book will help to stimulate such a movement.

Theory and Practice of Anæsthesia

By M. D. NOSWORTHY, M.A., M.D., B.Ch. Cantab., Anæsthetist to Westminster Hospital. London: Hutchinson Scientific Publications. 1935. Pp. 223. 12*s.* 6*d.*

THIS is a first-rate book for any man to study when he is beginning to give anæsthetics. That is not to say that it contains no substance for the experienced anæsthetist; indeed, it is so well conceived and clearly written that the expert may gain much from its perusal. Dr. Nosworthy's attitude towards his subject is throughout scientific and up to date, but he is fully alive to the value of the older methods and insists that the student must be thoroughly taught the use of ether and chloroform before he is allowed to extend his experience to other drugs. The author has a high opinion of the value of carbon dioxide in many conditions, especially for producing separation of the vocal cords. He commends cocaine (10 or 20 per cent.) as a spray to the throat to prevent laryngeal reflex, especially before laparotomy, and this measure, which originated we believe with Magill, is certainly not used as often as it deserves to be; its efficacy in aiding abdominal relaxation is remarkable. Dr. Nosworthy does not fail to point out the care that is needed to obviate inhalation of foreign matter when the larynx is thus deprived of its reflex.

In discussing respiratory failure under ether he makes a statement with which we cannot agree. It is fatal, he says, to resort to artificial respiration, as then the patient, from lack of carbon dioxide, will never breathe again on his own. Theoretically this may be right; in our experience it is not true in practice. In discussing the peripheral causes of respiratory arrest Dr. Nosworthy is able to show how some of the most modern methods may cause, if ill-applied, the very trouble they are designed to remove. For spinal analgesia Dr. Nosworthy prefers percaine and stovaine to novocain. His advice on the choice of the appropriate anæsthetic in various conditions, premedication, and after-effects is concise and helpful. An attractive feature of the book is that it contains no superfluous words. The print is of a capital size and clearness, and the illustrations plentiful. We should like the author to reconsider the use of the word "anæsthesia" in the title where "anæsthetics" would be appropriate; the former is a state (of loss of feeling), the latter is an art which may be practised.

Laboratory Manual of Physiological Chemistry

Third edition. By MEYER BODANSKY, Director of Laboratories, John Sealy Hospital, Galveston, and Professor of Pathological Chemistry, University of Texas; and MARION FAY, Associate Professor of Biological Chemistry, School of Medicine, in the University. New York: John Wiley and Sons, Inc.; London: Chapman and Hall Limited. 1935. Pp. 274. 10*s.*

THIS volume constitutes the third edition of a work which is the practical counterpart of Prof. Bodansky's well-known "Introduction to Physiological Chemistry." Both the books have had a success which can be attributed to the clear way in which they are written and the fact that the author has maintained a modern outlook. Of especial interest is the full practical course, which would however be considered too full for English medical students, whose curriculum does not provide much time for biochemistry. Most of the methods are colorimetric, and few teaching laboratories in this country are sufficiently well equipped to supply all the students with colorimeters.

British Journal of Children's Diseases

(Vol. XXXII., July–September.)—In a paper entitled A Contribution to the Epidemiology of Poliomyelitis Dr. Hjalmar Wennerburg, chief physician to the Epidemic Hospital, Gothenburg, maintains that neither the contact theory nor the water theory can solve the problem of infantile paralysis, but that the theory that the disease is disseminated by insects clearly explains all hitherto obscure phases of its appearance. As regards the species of insect, he is inclined to suspect some kind of mosquito.—Dr. E. Ashworth Underwood, in continuation of his article on the Neurological Complications of Varicella, deals with laboratory investigations of the cerebrospinal fluid, the relation between the occurrence of nervous complications, and the type of varicella, which shows that nervous complications are more liable to occur after severe attacks of varicella; the prognosis based on a study of 109 cases, of which 12 died, 80 recovered completely, 15 showed recovery with some sequelæ, and 2 did not recover; the pathology, epidemiology, and theories regarding ætiology. The last are classified in the following five groups: (1) The occurrence of encephalitis following varicella is purely fortuitous. (2) The nervous symptoms are due to the virus of some known disease. (3) The nervous symptoms are due to some unknown virus. (4) The condition is due to the virus of the primary disease, varicella. (5) The anaphylactic theory enunciated by Glanzmann, who holds that the nervous complications following varicella are a local anaphylactic phenomenon due to sensitisation of the nervous system to the actual virus of the disease.—In continuation of his Analysis of Over Four Thousand Cases of Educational Deafness seen during the past Twenty-five Years Mr. Macleod Yearsley describes a method of procedure whereby deafness in children can be detected at an early age, and urges that the deaf child should commence his special education as soon as possible, especially if he is born deaf or has become deaf during the first two years of life.—The abstracts from current literature are devoted to dermatology and syphilis.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 14, 1935

THE USE OF ASPIRIN AND SOD. SAL.

NOT the least of the contributions of chemistry to human well-being is the gift of aspirin, now manufactured and swallowed by the ton. Its analgesic effects and its safety are so widely known that its use has long passed into the control of the general public, with much encouragement from the manufacturers and little guidance from the medical profession. Yet the doctor is asked from time to time whether it is "safe" to go on taking aspirin, and he meets now and then a cautious patient who will venture to take five grains for her headache but is afraid to risk ten. He prescribes both aspirin and sodium salicylate very often himself, but not always with the precision or the understanding of their effects which modern knowledge renders possible. Only very rarely will he meet the clinical picture of poisoning from gross overdosage, so vividly described elsewhere in this issue by Dr. S. C. DYKE, but such cases are on record, and include fatalities not only from accidental or suicidal administrations but also—witness a recent French report[1]—from injudicious therapeutic use.

Decoction of willow-bark was a febrifuge dating from ancient times. Salicylic acid was prepared from it in 1838, and synthetically in 1860. Sodium salicylate was introduced as a remedy for acute rheumatism in the 'seventies, and hailed as a specific. Many regard it as such to-day, but on slender evidence. Since the cause of acute rheumatism is not known, no specific effect on the causal agent is at present demonstrable, and the question can be decided only by considering the amelioration of symptoms. Sodium salicylate reduces the temperature in acute rheumatism, but it does the same in "influenza" and some other febrile states, and to a slight extent in many normal subjects. It relieves pain, both in this and other conditions. Neither of those actions is specific, yet together they constitute most of the salicylate effect in acute rheumatism. The arthritis, it is true, subsides at the same time, which a gonococcal arthritis will not do under salicylate treatment; but then an acute rheumatic arthritis will often subside under antipyretic and analgesic treatment with other drugs, such as quinine and morphia. On the whole, however, the salicylates in acute rheumatism have a more prompt, regular, and satisfactory effect than other drugs or drug combinations and for that reason they remain unquestionably the remedy of choice. Such treatment is mainly if not entirely symptomatic, and unfortunately it does not seem to prevent the development of rheumatic carditis, or to influence the course of rheumatic chorea where antipyretic and analgesic actions are not called for. Where and how salicylate exerts its analgesic effect is unknown. It lowers temperature by disturbing the heat-regulating centre, causing vasodilatation in the skin, increased heat-loss, and often sweating. Larger doses cause ringing in the ears and vomiting, the latter being a central and not a gastric effect. The largest doses produce stupor. So far as is known, the antipyretic action, the vomiting and the coma form a sequence of effects exerted by increasing doses of salicylate on the brain. We choose to call the first therapeutic and the second and third toxic, but they may well be all of the same nature. In rheumatic fever the full therapeutic effect is desired. Sodium salicylate is absorbed and circulates as sodium salicylate; most of it is excreted unchanged in the urine, where it appears inside 10–20 minutes; the remainder is partly destroyed in the body, and elimination is complete in a couple of days. With such rapid absorption and excretion, accumulation is not to be feared, and dosage must be large and frequent if the adequate concentration in the blood is to be reached. Hence it is both safe, and necessary to a full therapeutic effect, to give 10–20 grains of sodium salicylate, hourly or two-hourly, until the patient vomits or his ears ring, which is likely to happen after 120–200 grains have been given. Then it should be stopped, or continued at a lower level, according to the course of the temperature and other clinical features.

Pharmacologically aspirin closely resembles sodium salicylate, but there are certain differences. Although sparingly soluble in water, it is absorbed from the intestine as fast as salicylate, and much of it reaches the blood as sodium acetyl-salicylate, which almost certainly has a more pronounced analgesic action than salicylate. It is rather more slowly excreted, but the same principles as for salicylate apply to its use in acute rheumatism, the "toxic" dose being a little smaller. To the stomach it is slightly irritating, and in an acid stomach some hydrolysis can occur yielding highly irritating salicylic acid. The chief value of the sodium bicarbonate which is customarily given with aspirin, as well as with sodium salicylate, is to counter these effects. With aspirin it will also counter any disturbance of the acid-base equilibrium which that acid—unlike the neutral sodium salicylate—might produce. HANZLIK,[2] to whom we owe much of our quantitative knowledge of the salicyl compounds in medicine, found bicarbonate without effect on the "toxic" symptoms of salicylism, and, although this has been disputed, it is supported by the fact that bicarbonate obviously does not impair the therapeutic effects of salicyl compounds, which are of the same nature as the "toxic" ones. He also found no difference between natural and synthetic salicylates, which used to be set against each other years ago; both of them are equally potent and equally toxic, and with modern methods of manufacture neither is at all likely to contain any harmful impurities. Aspirin has the peculiarity that not a few subjects are sensitive to it in the allergic sense, and after taking it may develop urticaria, œdema of face or pharynx, salivation, or asthma. They usually learn to avoid it, but there is real danger in it for some asthmatics who may not know of their sensitivity, or take it unwittingly in some proprietary form; two cases have recently been reported[3] [4] where 5 grains precipitated fatal asthmatic attacks. Apart from that danger however, aspirin in ordinary doses appears to be singularly safe, without harmful effects even after long periods, and not viciously habit-forming; while such evidence as we have, including Dr. DYKE's case, points to a fatal dose of the order of 500 grains.

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[1] Paisseau, G., Friedman, E., and Vaille, C.: Bull. et mém. Soc. méd. hôp. de Paris, July 16th, 1934, p. 1201.

[2] Hanzlik, P. J.: Medicine, 1926, v., 197.

THE ROUND WORLD

SHROPSHIRE is a proper place, and the enjoyment of anyone going up and down that delectable county will be about doubled if he reads and digests the guide book which Prof. W. W. WATTS, F.R.S., this year's president of the British Association, published about 15 years ago. It is an exceptionally good book for its purpose, for out of an account of the minutiæ which may be seen he builds up a convincing demonstration that the appearance of a neighbourhood and the lives of its inhabitants are due at bottom to its geological history. In the presidential address to the Association which he gave at Norwich last week he returns to the same theme in its wider aspects and discusses how the surface, not of a county but of the world itself, has come to look as it does. It is a little disconcerting to the layman to learn that there is no explanation generally acceptable to geologists of how the hills and valleys came into existence, no explanation, that is, of the features which, with all respect to those who love the wide skies of East Anglia, make up what most of us call "scenery." Trivial mounds and ridges may be the obvious results of glacial action; minor furrows are equally clearly the handiwork of rivers. These things were realised in the revolution of geological thought which led up to the "Origin of Species"; the wearing away of the earth's surface here and its piling up there have gone on in the past as they go on now, and the ceaseless action of everyday weather is responsible for the variety of surface which charms our holiday moods and, guided by Prof. WATTS, excites our interest. Such was LYELL's great contribution to the progress of knowledge. But when it comes to larger features the matter is not so clear and the origin of the Great Glen or of Snowdonia are matters on which there is still much difference of expert opinion. We used to be told that the skin of the earth has wrinkled as it cooled, as does the rind of a shrivelling orange. But is it possible that this has happened without the intervention of local changes so sudden and so great that they are indistinguishable from the paroxysms and catastrophes which were the universally accepted cause of the surface appearance of the earth till about 100 years ago? We might think more of these if we lived over a less phlegmatic part of the earth's crust and if earthquake had not dropped out of the occasions of violence and sudden death enumerated in our Litany. It is the present belief that the blocks of land which form our continents are floating on a denser liquid mass much as icebergs float in the sea. That they do not move about as fast is plain, but it seems quite likely that they have moved as much, and it is quite certain that what is now land has been under the sea often enough. These changes seem to need some occasional, perhaps periodic, motion of a violent and extravagant kind, and to the question of how that may have come about Prof. WATTS devotes the more technical parts of his address. One comforting reflection emerges—that through all these changes and chances the line of life has never been broken and biological evolution has gone on. We owe indeed much of our knowledge of it to the very fact that sea and land have been turned upside down. And if live things have survived so far, it seems hardly likely that they will succumb to any similar convulsions in the future; there will always be an ark of some kind.

IS CANCER OF THE LUNG INCREASING?

IN spite of the number of papers which have appeared in the last few years on the subject of lung cancer, there is still no decisive evidence whether this form of malignant disease is really on the increase or not. The recorded death-rate in England and Wales has certainly shown a pronounced rise during the last 30 years, but the very magnitude of the increase suggests, as the Registrar-General has pointed out, improved means of diagnosis as at least a major cause. One difficulty of accepting it as the sole cause is that the mortality-rate of males has risen considerably more than that of females. The impossibility of assessing the part played by such changing standards of certification of death has led to the attention of workers being transferred to the statistics of the post-mortem room, where a more stable degree of accuracy is likely to prevail. With these figures we are, however, faced with the problems of selection. Patients admitted to hospital are only a sample of all patients, and those submitted to autopsy are only a sample of all those dying in hospital. Whether persons suffering from intrathoracic cancer are more or less likely to be admitted to hospital to-day than, say, 25 years ago we do not know. In some hospitals it appears probable that they are more easily admitted, for purposes of teaching, ameliorative treatment or research. Where changing proportions of the dead are submitted to autopsy there is, likewise, no means of determining whether the type of case sent to post-mortem has not also changed. For instance, with a growing interest in lung cancer, patients in which this condition is suspected might be more frequently autopsied than in previous years. This would result in an apparently rising incidence. On the other hand, if patients dying of some other causes of death were more frequently than heretofore sent to autopsy we might well observe a declining incidence of lung cancer. This rate—the ratio of lung cancers to other causes of death—is, in fact, dependent both upon the numerator and the denominator of the fraction and changes in either must influence its level and trend.

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[3] Lamson, R. W., and Thomas, R.: Jour. Amer. Med. Assoc., 1932, xcix., 107.

[4] Dysart, B. R.: Ibid., 1933, ci., 446.

In a recent paper[1] R. D. PASSEY and J. McD. HOLMES, working with a combined grant from the London Headquarters and the Yorkshire Council of the British Empire Cancer Campaign, suggested that a more satisfactory denominator consists of the number of patients admitted to the wards of the hospitals. It is not unreasonable, they argue, to expect that if there be a large increase in the number of in-patients, there will be also a proportional increase, other things being equal, in the number of patients admitted with lung cancer, which will be reflected in an increase of the latter in the post-mortem room. The incidence-rate they use is, therefore, the number of post-mortem intrathoracic neoplasms expressed as a percentage of the admissions to hospital. Their figures, which were obtained as part of a larger inquiry into the incidence of cancer in general, the results of which are to be published later, were derived from 16 large teaching hospitals of London, the provinces, and Scotland. The statistics for all these hospitals combined show a considerable increase in the absolute number of lung cancers recorded at autopsy. But concurrently there has been between 1894 and 1924 a corresponding rise in the total admissions to hospitals, so that the percentage incidence has shown no significant change over those 30 years. In the last five-year period taken, 1924–28, the percentage incidence has risen, but this change is derived nearly entirely from 5 out of the 16 centres. In these particular centres the authors believe there are associated special circumstances, which they discuss, which may well have contributed to the increase. Generally, therefore, they find by this method no evidence to support the view that the incidence of lung cancer is appreciably on the increase.

These figures, though suggestive, hardly lead to a decisive answer. Over the period studied the total number of patients admitted to these hospitals has risen enormously, and in those hospitals which show no proportional increase in lung cancer this rise in total admissions has been greater than in those that do show some increase in lung cancer. In the former total admissions have risen by nearly 40 per cent. between 1909–13 and 1924–28, in the latter by 23 per cent. It is obvious that this change in the admissions may not equally affect all conditions. If, for the sake of argument, all lung cancers were admitted now and previously but to-day other morbid conditions are admitted which previously would not have been taken in, we should observe a declining proportion of lung cancers. As pointed out above, the denominator of the ratio is just as important as the numerator, and we can by no means be certain that it has not changed differentially. It might be argued that the lack of proportional increase in lung cancers in certain hospitals is due to the relatively greater number of admissions in recent years from other causes. That argument may be fallacious, but the point it places at issue is fundamental to the authors' case.

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[1] Quart. Jour. Med., July, 1935, p. 321.

DECORTICATION OF THE HEART IN PICK'S DISEASE

THE clinical picture of chronic adhesive pericarditis complicating rheumatic heart disease is a familiar one. The diagnosis of adherent pericardium is commonly made when the degree of cardiac hypertrophy seems excessive, when heart failure is early and intractable, or when signs of adhesion between heart and chest wall are evident. In such cases it is assumed that adhesion to the rigid chest wall embarrasses cardiac systole, and surgical measures have been directed to removal of part of the bony wall in order to enable the heart to contract more completely.

There is, however, another and far rarer form of chronic thickening of the pericardium, first described as an entity by FRIEDEL PICK of Prague in 1896, which is inadequately and often incorrectly described in medical text-books, and which hitherto has seldom been recognised during life. Dr. PAUL WHITE of Boston, who came to England this summer to deliver the St. Cyres lecture of the National Hospital for Diseases of the Heart, made this rare form of chronic constrictive pericarditis the subject of his lecture. We are indebted to him for the most complete account of the disease yet published in this country.[1] Pick's disease consists essentially of a chronic thickening and induration of the pericardium, often with calcification. The heart is imprisoned in a rigid cage which prevents diastolic expansion, and soon leads to venous stasis. In contrast to the rheumatic type of chronic pericarditis, Pick's disease causes little or no enlargement of the heart, and murmurs are exceptional. The cardinal features of the disease consist of dyspnœa, œdema, engorgement of the neck veins, enlargement of the liver, and ascites. Abdominal swelling is often an early symptom, and in the absence of any objective sign in the heart may suggest cirrhosis of the liver. For this reason PICK used the term "pseudo-cirrhosis of the liver" in his description. Owing to the frequent occurrence of calcium deposits in the indurated pericardium, which can be detected by X rays, radiological examination of the heart is often of great value in diagnosis. A low blood pressure and a small pulse are also characteristic. The ætiology of Pick's disease is obscure; some cases are undoubtedly tuberculous, and in others there is a history of antecedent acute pericarditis of infective origin, but acute rheumatism apparently plays no part in the ætiology.

The importance of better recognition of Pick's disease lies not in its frequency, but in the discovery of its amenability to treatment. Because the myocardium and the valves are not primarily involved, and are often relatively healthy, the cardiac function can be restored by removing the constricting pericardial cage. White describes the operation employed to this end by Dr. E. D. Churchill at the Massachusetts General Hospital, which consists essentially of resecting as much as possible of the indurated pericardium. Those who were privileged to see White's remarkable film of the operation in progress are not likely to underestimate the magnitude or dangers of the surgical procedure involved. It is not one to be lightly undertaken, and calls for an experienced thoracic surgeon. The results of successful decortication of the heart in this way are however impressive. White records 12 cases; of ten cases operated on by one surgeon, six were completely cured and one much relieved. His lecture should stimulate the interest of physicians in the diagnosis of Pick's disease and encourage thoracic surgeons to study Churchill's work.

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[1] See THE LANCET, Sept. 7th, p. 539, and p. 597 of this issue.

ANNOTATIONS

THE MATRIMONIAL CLINIC

A METROPOLITAN police-court magistrate offers to members of the medical profession a new, if limited, opportunity of social service. In his recent book, "Wife *v.* Husband in the Courts,"[1] Mr. Claud Mullins explains that, in a proportion of matrimonial disputes in the police-courts, the good offices of a doctor are essential. Where sexual relations are the cause of the discord, Mr. Mullins believes it to be the only helpful course that the parties should be persuaded to discuss their troubles with a doctor before they embark on litigation against one another. Religious or moral appeal, he declares, will do little good. Constructive re-education in decent sexual standards is what is needed, and this task, he maintains, should not be assigned to laymen. He stipulates, however, that the doctors must be carefully selected; "unfortunately some of them have inhibitions and cannot help in cases of sexual difficulty." Lest the medical profession takes this reproach too much to heart, it may be added that elsewhere Mr. Mullins is equally critical of magistrates. A justice, he says, who has an excess of false modesty had better devote his or her attention to motoring summonses and avoid matrimonial cases. On the other hand he is aware of justices at the opposite extreme who, to quote his own words, find a sadistic pleasure in earing about other people's sexual experiences or o belong to the school that finds sex at the base all human actions. These too he recommends to absent themselves when husband and wife come to court.

Mr. Mullins's writings have shown him to be a reformer. His latest book sets out clearly the improvements he proposes. Some of them, commended in his final chapter, have already been passed into law with surprising promptness in the recent Money Payments (Justices' Procedure) Act. Others, which require no statutory authority, he has introduced in the south-western district of London where he himself sits. He has set aside, for instance, a special afternoon each week for matrimonial cases; in this way they are no longer mixed up with ordinary criminal business. He does his best to exclude the public and the newspaper reporters. Gossiping neighbours, he says, make trouble by repeating what they hear; and once a domestic story gets into the papers all chance of reconciliation may be lost. He knows how legal formalities and conventions perplex common folk. The police-court plan of putting one person in the dock and another in the witness-box may work well for a charge of burglary but is inconvenient for a matrimonial dispute. Mr. Mullins puts husband and wife on chairs facing him at an angle. They give their evidence comfortably from where they sit, instead of being marched about the room. They are encouraged to talk at their ease and are not pressed to cross-examine one another—a task of which the law optimistically believes all parties capable. By such devices the police-court becomes something like a matrimonial clinic. The magistrate of the old school confined himself to administering the law as he had received it, giving the applicants their remedy if the case was made out. The magistrate of the new school asks the probation officer to have a chat with the parties before the summons is heard. The old school conscientiously decided the relevant questions—Has desertion been proved? Has the husband wilfully neglected to maintain his wife? The new school postpones the answer to these questions till preliminary inquiry has exhausted the possibilities of healing the breach; it refuses to treat the summons as a declaration of war and the hearing as a dog-fight. It is in this scheme of informal investigation that Mr. Mullins seeks to enlist the doctor for "moral ambulance" work.

There is of course one obvious difficulty. The doctor will be told things which the magistrate would ordinarily never hear. Mr. Mullins appreciates that doctors will not receive confidences unless they keep secrets. At his own police-court, he says, professional confidence is respected and neither the magistrate nor the probation officer seeks to infringe it. In this work of informal preliminary investigation, by whomsoever it be undertaken, there is also a legal obstacle. The magistrate's decision must be based upon evidence given in open court; the private reports of an investigator, and the personal opinions he forms as to the rights and wrongs of the case, are not evidence. Mr. Mullins admits that the existing law prevents him from taking into account what the probation officer tells him in this way. An exception has been made for juvenile courts; special statutory rules allow the magistrate to receive and consider written reports furnished by probation officers without their being read aloud. The introduction of similar procedure for matrimonial cases is probably a long way off. Public opinion will hardly be persuaded of the propriety of inquisitions, however well-meaning, into English home life, and native caution will hardly encourage semi-official intervention between husband and wife. If meanwhile the progressively minded magistrate feels that his social work is thereby hampered, the doctor will be relieved to find that, if he has been able to help towards the sympathetic adjustment of domestic discords, he will not be expected subsequently to divulge the confidences entrusted to him.

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[1] Wife *v.* Husband in the Courts. By Claud Mullins. London: George Allen and Unwin Ltd. 1935. Pp. 128. 3*s.* 6*d.*

OLIVE OIL LAVAGE IN CARBOLIC ACID POISONING

DISSATISFACTION with existing antidotes to acute phenol poisoning has prompted L. Goodman and A. J. Geiger[1] to an attempt to find a commonly available oil which will be more effective than liquid paraffin whose efficacy they regard as negligible. In their view alcohol also is disappointing as an antidote and may even do harm. Their search was limited to the true oils because of the readiness with which these oils are miscible with phenol, and of these olive oil appeared to be the most suitable because it is bland, cheap, and a household commodity. The minimum lethal dose (M.L.D.) of phenol was standardised on rats at 0·3 g. of phenol liquefactum per kg. of rat, and the protective value of various substances was then assessed against a dosage of one or two M.L.D. The first 45 experiments showed liquid paraffin administration to be ineffective, and subsequent experiments were devoted to studying the effects of olive oil, which was found greatly to raise the survival-rate of their rats if administered *before* the phenol. Administered *after* the phenol its value was not nearly so great unless it was used as the medium for gastric lavage.

Unfortunately they do not report any control experiments of lavage with plain water; in the absence of these, the criticism arises that the real reason for the benefit obtained with olive oil gastric lavage may have been the mechanical removal of the poison and that many other fluid media might have worked equally well. Most people with experience in the treatment of cases of acute poisoning hold that removal of the poison by thorough and painstaking washing out of the stomach is of far more importance than the administration of antidotes. Lavage properly performed entails the use of many pints of fluid. Goodman and Geiger have not tried olive oil in human cases. There seems no reason why it should not be tried as the fluid used in gastric lavage for carbolic acid poisoning, but there is no evidence to justify its use merely as a neutralising antidote without lavage.

THE WAYS OF THE LOCUST

IN a recent address to medical officers of health,[2] Dr. Dunstan Brewer urged his hearers to go to the locust and consider her ways; for there is a suggestive analogy between the appearance of plagues of locusts and of infectious diseases, and there is the possibility that the excessive multiplication of the locust that precedes migration is associated with insusceptibility to a natural agent which normally keeps the numbers down. The locust (as an economic problem) is very much in the air at the present time, and it is to be hoped that the laws which govern the devastating migrations of this insect will before long be understood. This much seems to be established. During the years in which locust swarms are absent, the insect is living a solitary life in certain "permanent habitats" under an outward form so different from its swarming cousin that it was long regarded as another species. Then something happens—it is generally believed to be a particular combination of favourable climatic conditions—and the locust population begins to increase. When this increase has reached a given level the insects tend to congregate, and in the course of a few generations (a generation takes about six weeks) they become transformed into a swarming phase which differs in form and coloration from the solitary phase of the same species as markedly as it does in temperament. Indeed there is some experimental evidence to prove that it is the restless activity of the densely crowded swarms which is directly responsible for their striking differences in form and colour. Once the migrating swarms are formed they are faced by legions of enemies. They are preyed upon by birds and mammals, attacked by insect parasites, subject perhaps to epidemic bacterial diseases, and assaulted by the traps, the dusts, and the poisons of locust officers. Ultimately these factors, combined maybe with a destruction of their own food-supply, gain the upper hand. The numbers decrease, the swarms are thinned out, and gradually the species reverts to its peace-loving solitary phase.

PERCAINE FOR SPINAL ANALGESIA

MOST anæsthetists who have persevered with the trial of the method of using percaine which was introduced by the late Dr. Howard Jones have come to regard it as extremely valuable. In the *Journal of the Canadian Medical Association* for August, Dr. F. Tempe records the result of 800 injections. He does not use the method on any patient with a blood pressure below 110 systolic, and he employs no preliminary injection except half a grain of ephedrine, a quarter of an hour before operation, in order to counteract the "hypotensive crisis of the twentieth minute, the result of the diminution of the vascular tone through paralysis of the sympathetic vasoconstrictors." Dr. Tempe refers to another precaution which is too often omitted. This is the immersion of the ampoules in warm water so that the solution is at body temperature when introduced into the spinal canal. It is highly probable that this device greatly reduces the likelihood of meningeal irritation. The amount of percaine which he uses does not exceed 15 c.cm. even for operations on stomach, biliary passages, or kidney. He finds that the 15 minutes' wait commonly recommended after injection can generally be curtailed, but he regards as a danger signal any complaint of headache or nausea in the first five minutes. The article includes other useful little tips of practice, and it is obvious that the success which Dr. Tempe has enjoyed is the reward of a careful as well as highly intelligent employment of a method excellent in itself but easily misused.

AN UNSUSPECTED OCCUPATIONAL HAZARD

ACCOUNTS come from two independent sources of an occupational risk previously unsuspected. It may arise in the process of electro-welding or in using oxy-acetylene burners, when, in either case, work is being carried on in a confined and badly ventilated space. Careful research at the Harvard School of Public Health[1] has revealed that during these processes nitrous fumes are generated from combination of the atmospheric gases. Hence arises an insidious and far more serious hazard than that of metal fume fever with which it has been confused, the confusion having arisen from the fact that sometimes galvanised surfaces are being treated by the welding flame when zinc oxide is boiled off. Metal fume fever, also known as brassfounders' ague, does no lasting harm; its effects are not cumulative; and the substances causing it, such as the oxides of zinc and magnesium, are not true industrial poisons. The inhalation of nitrous fumes is different; the risk is insidious, as the fumes can be breathed without much immediate inconvenience; but a few hours later pulmonary œdema supervenes and not infrequently ends fatally. Such was the fate of animals exposed sufficiently to the fumes from electro-welding. A fatality is reported from America of a man employed in the basement of an apartment house at electro-welding the two halves of a galvanised hot-water tank. In this country no less than 17 other cases, one being fatal, are reported[2] following the use of large oxy-acetylene burners for the purpose of heating a heavy steel crosshead in order to remove it from the rudder post in a confined space on board a large liner. Here then is a hazard which, when once its existence and nature are recognised, may easily be avoided. Either the workplace may be well ventilated, or the fumes may be removed by local exhaust, or suitable respirators or air masks may be worn.

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[1] Amer. Jour. Med. Sci., 1935, cxc., 206.

[2] Royal Sanitary Institute Health Congress, Bournemouth, July 17th, 1935.

[1] Titus, Warren, and Drinker: Jour. Indust. Hyg., July, 1935, p. 121; Williman, F. L.: Ibid., p. 129; Drinker, Warren, and Page: Ibid., p. 133.

CAUSATION AND TREATMENT OF MORPHINE ADDICTION

A NOVEL theory of morphine addiction and of the symptoms which may attend the withdrawal of the drug has been advanced by Dr. Iwan I. Ostromislensky, of New York, formerly professor of organic chemistry in the University of Nijni-Novgorod. His theory of addiction propounded is based on analogy with anaphylaxis. Morphine, it is suggested, generates an antigen and the antigen produces an antibody which appears on about the twentieth day after daily administration. The withdrawal of morphine from an addict, on this assumption, will leave the antigen to react on its antibody and occasion symptoms of anaphylactic shock, accompanied by a "craving" for the drug, which if unrelieved may result in collapse and death. This theory of addiction has led Dr. Ostromislensky to advocate the employment of a new synthetic preparation (diphenylmethylpyrazolonyl) as a "valuable therapeutic for the unfortunate morphine addicts." It is claimed that the new remedy, which has been named "rossium," relieves the craving, checks the withdrawal symptoms, and overcomes addiction to the drug. In a communication to the Russian Medical Society in New York[3] it is stated that the remedy is being tested in hospitals and sanatoria in the United States and in Canada.

MARRIAGE OF SYPHILITICS UNDER TREATMENT

ONE of the urgent questions put to their doctors by adult male patients suffering from syphilis is when intercourse is to be allowed. The conservative practitioner usually allows marriage without restrictions after a period of three to five years of treatment and observation. When the biological urge is very great intercourse is usually permitted after a shorter period to men with negative Wassermann reactions provided that they are actually receiving arsenical injections at the time and that they wear a condom as a protection against seminal infection. That this latter may occur has been shown not only experimentally in monkeys but also by demonstrating spirochætes in human semen by the dark-ground method. In a recent investigation[4] the infectivity was tested of the semen of 25 syphilitic patients, 5 acute and 20 chronic, all under treatment with arsenic or bismuth or both. The semen was collected aseptically and was injected into the testicles of two rabbits within half an hour of ejaculation. After three months of negative observation by dark-ground illumination of puncture fluid taken from the testicles of the rabbits, their inguinal glands were ground up and passaged into two fresh animals, who were similarly observed. In no case was there any demonstrable lesion or spirochætes. The authors draw the conclusion that the syphilitic is not infectious for so long a period as is generally thought, and that marriage might safely be allowed at an earlier period. This conclusion seems to us unwarrantable, being based on 25 cases in which only one examination was made, and that presumably whilst the case was under treatment. Once intercourse is allowed it is unlikely that the average patient will confine himself to specified periods—i.e., during courses of injection—and there is nothing in the experiment to show how long the semen remains safe. D. Nabarro in this country has shown cases where the birth of normal children, conceived after the parents have had some treatment, was followed by the birth of a syphilitic child as the result of a relapse of the disease, or the awakening of a latent syphilis. It would therefore seem wiser to continue to insist on fully three years of treatment and observation before allowing marriage. Greenbaum and his collaborators suggest that their method of examining semen might be of value as a method of testing syphilitic men who insist on marriage before they have had adequate therapy. The test would certainly be a useful adjunct to venereal practice if it proved to be reliable after the first animal inoculation, and the passage into the second animal, which adds another three months to its duration, could be dispensed with; further trial would be essential before this could be assumed, and even then the cautious physician would insist on at least two negative results.

VITAMIN C AND ASCORBIC ACID

OUR leading article of August 24th touched only briefly on the identification of vitamin C with ascorbic acid, and the account given by Mr. S. S. Zilva, D.Sc., in the August *Archives for Disease in Childhood* deserves a further note. The discovery is one which illustrates the intimate relations of chemistry and medicine. Briefly it arose out of two apparently unconnected observations; one the isolation from the adrenal cortex (in 1928, by Szent-Györgyi working in Gowland Hopkins's laboratory) of a strongly reducing hexose derivative, called by him hexuronic acid; the other the elaboration of a test by the late J. Tillmans of Strasbourg to discriminate between lemon juice made from fresh lemons and spurious imitations thereof. Tillmans's test consisted in using 2:6 dichloroindophenol as an indicator, this being decolorised by the real, but unaffected by the artificial, lemon juice; and he came to the conclusion that the substance which reduced the indicator was vitamin C. Hexuronic acid was also found to decolorise 2:6 dichloroindophenol; Tillmans suggested that it was probably identical with vitamin C; and in 1932 Szent-Györgyi actually proved that it had antiscorbutic powers. Then came a series of investigations in the chemistry department of the University of Birmingham by W. N. Haworth, E. L. Hirst, and others, with the following results: (1) the hexose derivative obtained by Szent-Györgyi was found by Haworth and Szent-Györgyi to contain a molecule of water less than is required for a hexuronic acid, and the name ascorbic acid was suggested in its stead; (2) the structural formula of ascorbic acid was elaborated; (3) in conjunction with Zilva the antiscorbutic power of ascorbic acid was shown to be a property of the acid and not of any associated impurity; and finally, (4) *l*-ascorbic acid was synthesised from *l*-sorbose. The synthesis of *l*-ascorbic acid was also carried out and published earlier in the same month by T. Reichstein of Zurich, but his method is not so simple as Haworth's which also has the advantage of being quite inexpensive. L. G. Parsons and P. Schultzer in 1933 reported the cure of scurvy with ascorbic acid obtained from natural sources,[1] and A. D. C. Bell, Parsons, and others have since proved the antiscorbutic powers of synthetic products.[2]

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[2] Annual Report of the Chief Inspector of Factories for 1934. London: H.M. Stationery Office. 1935. Pp. 68–69.

[3] Medical Record, 1935, cxli., 556.

[4] Greenbaum, S., Katz, S., and Rule, A.: Amer. Jour. of Syph. and Neur., 1935, xix., 210.

RHODA ERDMANN

THE death was announced last week in Berlin of Prof. Rhoda Erdmann—well known as one of the pioneer workers in tissue culture. Prof. Erdmann began her scientific career as a protistologist. Just before the outbreak of the war she went to America and worked at Princeton and Yale; her interest was aroused in tissue culture, which became her life work. On returning to Germany she was appointed head of the department of experimental cytology of the University Institute for Cancer Research in Berlin, and later was elected professor in the medical faculty of the university. From her laboratory there emerged numerous valuable contributions to the study of growth in vitro, with special reference to malignant growth. In 1922 she published a book entitled "Praktikum der Gewebepflege oder Explantation besonders der Gewebezüchtung," which outlined in detail a complete course of instruction in tissue culture for university students. Prof. Erdmann was perhaps best known to biologists as the founder and editor of the *Archiv für experimentelle Zellforschung besonders Gewebezüchtung (Explantation)*, which under her able direction became the recognised international medium for the publication of researches in tissue culture. She took the leading part in organising the International Congress for Experimental Cytology, and was present in this country at the third meeting of this congress at Cambridge in 1933. At that time her health was the cause of anxiety to her many friends, who admired the courage and enthusiasm which have sustained her in her work during recent years in the face of many difficulties.

IMMUNISATION AGAINST TETANUS

PASSIVE immunisation of the wounded during the war had an immediate and striking effect in lessening the incidence of tetanus. For every 20 cases before, only one occurred after this method was in general use, and those that did occur were mainly mild and chronic. In spite of its comparative success, passive immunisation has certain disadvantages which were pointed out in a letter addressed to our columns[3] two years ago by Mr. H. H. Brown. Of these the chief are: (1) that antitoxin may not always be available, (2) that horse-serum sensitises to foreign protein, and (3) that its protection may pass off too soon. To these should be added another: that tetanus may follow slight wounds for which antitoxin would probably not be given. Active immunisation is free from these drawbacks and Mr. Brown pointed out that there is no adequate reason why it should not be generally employed to protect against tetanus as it is against diphtheria and scarlet fever. For some time past this method has been used officially in the French army, antitoxin being given with the first injection of toxoid, followed by two further injections of toxoid alone at intervals of two or three weeks, when any sort of wound has been inflicted. Mr. Brown would extend its use and suggests the active immunisation against tetanus of all soldiers before they are called out on active service, especially in countries where tetanus is prevalent.

In a recent paper[4] Dr. P. A. T. Sneath and Mr. E. J. Kerslake, working at the Connaught Laboratories, Toronto, have studied the persistence of antitoxin after active immunisation. Serum was obtained from 13 persons two years after the last of a series of three injections of tetanus toxoid. These observers found that the residual antitoxin showed no sign of having fallen below the level found from 12 to 15 months after the last dose (between 0·025 and 0·1 unit per c.cm. of serum). Further, when a secondary stimulus of 1 c.cm. of toxoid was given to these patients it effected a definite increase of titre within a week, and this persisted at significantly high levels after one month. In 12 patients treated in this way, within a week of the last injection of toxoid, five showed 5 or more units per c.cm., two showed 2·5 units, three at least 1 unit, one between 0·1 and 0·5 unit, and one 0·01 unit per c.cm. of serum. The amount of antitoxin so produced fell slightly in some after another month, but persisted at significantly high levels. Titres similarly attained in another group of patients were shown to persist at or above the level of 0·1 unit per c.cm. in nine out of ten patients. The level of 0·1 c.cm. to 0·25 unit per c.cm. of serum represents the maximum antitoxin level reached in the blood-serum of patients injected with 1500 American units of antitoxin.

These observations lend support to Mr. Brown's contention that active immunisation against tetanus for soldiers before they are called out on active service may prove more efficient than the passive method hitherto employed.

"PROGNOSIS"

THE first 66 articles of the series on Prognosis now appearing in our columns have been collected in book form, following the practice adopted for the earlier series on "Modern Technique in Treatment" and "Clinical Interpretation of Aids to Diagnosis." In the volumes previously issued the articles were printed in the order in which they had appeared in THE LANCET; in the volume on prognosis, which is published this week, they have been classified into systematic groups to facilitate quick reference. These groups serve also to suggest gaps which will be filled, so far as is possible, as the series proceeds.

Dr. John Ryle, physician to Guy's Hospital, has been appointed regius professor of physic in the University of Cambridge in succession to Sir Walter Langdon-Brown, who is retiring on Sept. 30th on completion of his term of office. Since King Henry VIII. founded the chair in 1540 all the regius professors except one have held medical degrees gained at Cambridge. The exception was John Blyth, the first regius, who took his M.D. at Ferrara. The twenty-first regius is a London graduate and the first Guy's physician to be thus honoured. To find a younger regius we should have to go back more than a hundred years.

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[1] See THE LANCET, 1934, i., 427.
[2] Ibid., 1935, i., 547, 999.
[3] Ibid., 1933, ii., 1509.
[4] Brit. Med. Jour., 1935, ii., 290.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXVIII.—PROGNOSIS IN FIBROIDS

THE extended scope of myomectomy which has been developed during the last two decades has brought with it a considerable increase in our knowledge of fibroids. It would appear that in most cases the tumours as "seedlings" are laid down somewhere between the twenty-fifth and thirty-fifth years of the woman's life, and that after that period further formation of seedlings is uncommon. Fibroid forming is therefore to be regarded as a phase in the life-history of the uterus rather than a habit, and in this respect fibroids are analogous to gall-stones, the formation of which is also a phase rather than a habit. This is fortunate, otherwise the operations of cholecystotomy and myomectomy would be inadequate, for new stones or new fibroids would begin to be formed very shortly after the respective operations, whereas the recurrence of stones after cholecystotomy only takes place in 7 per cent. of the cases, and recurrence of fibroids after myomectomy in only 5 per cent. of the cases.

AGE AS A FACTOR IN PROGNOSIS

Though the ten years from 25 to 35 can be looked upon as the "normal" period during which fibroids may begin to form, there are certain patients in whom they begin earlier, and certain others in whom they begin later.

The growth of a fibroid is at first slow, but as it enlarges the rate tends to increase. It is probable, however, that a fibroid does not commonly give rise to any symptoms or gross signs until five years or more have elapsed from its incipience. The chief exceptions to this rule apply to submucous fibroids, which, by reason of their position, may early give rise to menorrhagia. It is generally assumed that fibroids grow faster the younger the woman, but rapid growth is often observed in the relatively aged.

Relation of age to rapidity of growth.—It is excessively rare for fibroids to be discovered in a woman below 20 years of age, and I personally have never seen them under 19, though their presence in children has been recorded. From 20 to 25 they are still rare, but from 25 to 30 they are met with much more often, though they are still comparatively uncommon. The bulk of patients presenting themselves for the first time with fibroids are between 35 and 50 years of age. When fibroids are discovered in a patient under 25 an abnormal fibroid-forming tendency on the part of the uterus must be inferred.

We have no knowledge as to why some fibroids grow slowly and some relatively quickly. It is generally held that the more vascular the uterus the faster will a fibroid grow, and the effect of pregnancy is cited as a proof of this. It is however doubtful, to my mind, whether pregnancy does have this effect. Certainly much of the enlargement is merely apparent, being due to the hypertrophy of the uterine wall over the tumour. It is, further, a remarkable fact that high vascularity of the uterine wall is usually associated with degenerative changes in the fibroid or fibroids which it encloses. These degenerative changes are necrobiotic in character, the unstriped muscle-fibres of the tumour undergoing a hyaline swelling and softening which may end in complete diffluence, and pari passu with this change large irregular blood sinuses make their appearance in the substance of the tumour. As a result the tumour enlarges, but the enlargement is due to swelling of the fibres and influx of blood, and not to growth in the strict sense of the word. It appears to be an absolute rule that fibroids never form de novo after the menopause, and an almost absolute rule that they do not continue to grow after that event, or even enlarge from causes other than growth, for (excluding malignant transformation) such a happening is limited to the rare occurrence of cystic degeneration. Uterine tumours appearing after the menopause are practically always due to some form of malignant disease, and should be so diagnosed, no matter how much their consistence and shape suggest fibroids.

As far, then, as the rate of growth is concerned, age is an important factor in prognosis only when the patient has passed her menopause, for before this event there is no certain relation between rate of growth and age. It is obvious that the younger the patient the longer time is there for the tumour to grow: a tumour the size of a golf-ball discovered in a woman of 50 is unlikely to attain any great size, simply because, short of unusually rapid growth, there is not time enough before the menopause for it to do so, but a tumour of the same size discovered in a young woman of 30 is practically certain to become large because it has 20 to 25 years in which to grow. In this connexion, it is to be remembered that fibroids postpone the menopause, and patients possessing them most frequently do not experience it until well after their fiftieth year.

Effect of size on symptoms.—Speaking generally, the larger the tumour the greater the likelihood that it will produce symptoms, if it is not already producing them. On the other hand, small tumours may produce marked symptoms and very large ones practically none at all. Some of the largest that the surgeon has to deal with have been thus symptomless for years, so that time has been given them to attain a remarkable size. This particularly applies to broad-ligament fibroids, a variety which has yielded by far the greatest proportion of the giant fibroids weighing anything up to 50 lb. that can be found recorded in the literature.

FACTORS INFLUENCING PRODUCTION OF SYMPTOMS

The prognosis of fibroids, in so far as the likelihood of their producing symptoms is concerned, is largely governed by the age of the patient: the younger the woman the greater the likelihood. There are other points, however, to be considered. The commonest symptom is menorrhagia, and its occurrence is the more likely the more the tumour approaches the cavity of the uterus—that is to say, when the fibroid is submucous. A submucous fibroid causes symmetrical enlargement of the uterus, and hence when this is present the probability of menorrhagia developing (if it has not already done so) is greater than when the uterus presents bosses and irregularities indicating a subserous location. On the other hand, fibroids are more commonly multiple than solitary, so that the undoubted presence of subserous tumours does not exclude the possibility of the uterus containing a submucous tumour. Further, subserous tumours when large quite commonly cause menorrhagia because they increase the general vascularity of the organ.

Menorrhagia, once established, almost always gets worse with time, and the menopause-delaying effect of fibroids is important in this connexion. Patients bled white by the long continuance of excessive periods sometimes state that they lose less than they used to do. They do, because they have so little blood to lose, but when considered in relation to their anæmia the periods are just as excessive or more excessive than ever. It is noteworthy that so soon as the blood content is increased by the administration of liver and iron the amount lost is increased. The attempt to augment these patients' blood content is like trying to fill a bottle with a hole in it. Symptoms due to pressure are most likely to develop quickly when the tumour is growing low down in the uterus, especially when it is situated in the supravaginal cervix. Frequent urination is the common symptom, and later on attacks of retention. Tumours outside the pelvis do not give rise to pressure symptoms until they have attained a great size and sometimes not even then. Degenerative changes may give rise to acute symptoms, but it is impossible to gauge the likelihood of such a happening in any individual case of fibroids, as our knowledge of the cause of these degenerations is insufficient; all that is certainly known being that pregnancy conduces to such changes very markedly, and particularly to that form of necrobiosis to which the adjective "red" is applied. Fibroids are less likely to degenerate after the menopause, but calcareous degeneration is common in old women and can give rise to symptoms. Torsion of a fibroid is a rare event and could only affect one that was subperitoneal and pedunculated.

RELATION OF FIBROIDS TO CHILDBEARING

The prognosis of fibroids as regards childbearing can be approached from two angles: the effect of the tumours on childbearing and the effect of childbearing on the tumours. Speaking generally, fibroids militate against pregnancy, and the more so the more deeply they are placed. Their effect on labour depends on their situation. Small superficial tumours do not interfere with the event, but large, deeply placed tumours may bring about miscarriage or distort the lie of the child, or cause actual obstruction.

Pregnancy has an adverse effect on fibroids chiefly because it induces acute degeneration in them. The question whether it increases their rate of growth has already been dealt with, but whether it does or does not, the united bulk of the tumour and the pregnancy makes the uterus abnormally large. In any case of fibroids the possibility of pregnancy is a strong indication for the removal of the tumour before the event.

CHANCES OF MALIGNANCY

In any discussion on the prognosis of fibroids the chances of malignancy are an important part of the consideration. There are three possibilities: (1) a tumour deemed to be a fibroid may, in fact, be a malignant growth; (2) a fibroid may undergo sarcomatous change; and (3) a carcinoma may develop in a myomatous uterus.

As regards (1), it is to be remembered that it is only in a proportion of fibroids that the medical man can be absolutely certain of the nature of the mass he feels, and that other enlargements of the uterus and certain enlargements of the ovaries or tubes can very exactly simulate the contour and consistence of fibroids. This particularly applies to malignant disease of the ovaries occurring in elderly women, and this is frequently mistaken for fibroids. "Fibroids" first declaring themselves after the menopause are rarely fibroids.

(2) Sarcomatous change is said to occur in 2 per cent. of all cases of fibroids that come to operation, but in my experience this estimate is too high. It is an uncommon event, and such samples as I have seen have mostly been in women who have been known to have fibroids for years but who have been advised against or declined an operation. The advent of malignancy is insidious, being only accompanied by vague pain and discomfort in the pelvis. In most of the cases there has been no suspicion of gravity before the operation, and the microscopical findings have come as a surprise. The outlook is bad, for recurrence after removal is common.

(3) I have no doubt that fibroids predispose to carcinoma of the body of the uterus, for so many of the patients I have operated on for the latter condition have been found to have them. Moreover, corporeal carcinoma is very rare in women before the climacteric; but, in almost all the examples I have had experience of, the malignant growth was associated with fibroids. Carcinoma of the cervix is a rare complication of fibroids because the latter make for sterility, whilst the former is almost limited to parous women.

TYPE OF OPERATION

Finally, we must consider the prognosis of fibroids in relation to operative removal. Of the three operations, myomectomy, subtotal hysterectomy, and total hysterectomy, the operative case-mortality of myomectomy and subtotal hysterectomy is about the same (1 per cent.), whereas that of total hysterectomy is somewhat higher. These figures, of course, apply only to surgeons expert in this class of work. Total hysterectomy removes all possibility of further fibroids, but a few cases are on record in which after the subtotal operation a fibroid appeared in the conserved cervix. It is a most unusual event.

My own figures show that after myomectomy fresh tumours form in the conserved uterus in less than 5 per cent. of the cases, and to the extent of requiring further operation only in less than 3 per cent. The liability is greatest when myomectomy is carried out on young patients, particularly when the uterus contains a number of tumours, for in such persons, as I have already pointed out, a special predilection must be inferred. For example, I once removed 92 fibroids from the uterus of a girl of 19, but within a few years the uterus had to be removed on account of fresh tumours. On the other hand, it is in young women that preservation of the uterus is peculiarly desirable.

CHILDBEARING FOLLOWING MYOMECTOMY

The childbearing value of the conserved organ is considerable, as the following shows:

Out of 77 women on whom I performed myomectomy and who subsequent to the operation desired to have children and were in a position to have them, no less than 30 had conceived by the time I collected these figures. Of these 30 women 26 had conceived once, 2 had conceived twice, and 2 had conceived three times. The manner of delivery was as follows: of the 26 who had conceived once 18 delivered themselves naturally, 6 had Cæsarean section, and 2 miscarried. Of the 2 who had conceived twice, the deliveries were all natural; whilst of the 2 who had conceived three times the deliveries in one case were all natural, while the other had one natural delivery and two Cæsarean sections. The frequency of Cæsarean section is accounted for by the fact that, many of the patients being elderly, it was specially important to obtain a living child.

In conclusion, the following case is worth recording as showing the possibilities of childbearing after myomectomy even in extreme cases. In 1922 I removed seventeen fibroids from the uterus of a nullipara of 27 who was very anxious to have a child. Seven years afterwards I operated again on account of menorrhagia and abdominal pain. Six new fibroids were removed, and in addition "chocolate cysts" were enucleated from both ovaries. In 1934 pertinacity was rewarded, for she became pregnant, and this year I delivered her of a living child by Cæsarean section.

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SPECIAL ARTICLES

MALIGNANT DISEASE IN THE NATIVES OF KENYA

BY F. W. VINT, M.D., B.Sc.

(*From the Medical Research Laboratory, Kenya*)

THE following observations may be useful as a contribution to our knowledge of cancer in races living in a primitive environment.

In 2378 tissues from the natives of Kenya, examined for all conditions, I have found 546 (or 23·8 per cent.) with malignant change. The tumours found are given in Table I., and the data assume greater importance for native races in general if they are considered in conjunction with those of Smith and Elmes[1] for the natives of Nigeria, quoted in the right-hand column.

TABLE I.—*Analysis of the Tumours Found* (546)

Type.	No. and per cent.	Smith and Elmes[1] Nigeria percentage.
Carcinomata*	277 (50·7)	48·6
Sarcomata†	178 (34·4)	36·0
Melanomata	59 (10·8)	8·0
Endotheliomata ..	15 (2·7)	3·4
Teratoblastomata ..	14 (2·5)	0·4
Chorion epitheliomata .	2 (0·3)	0·2
Hypernephromata ..	1 (0·1)	—

* Including 10 mixed tumours of the parotid.
† Including myeloid sarcoma.

The most striking features of this Table are :—

(*a*) The close agreement between the figures for the natives of Nigeria and those of Kenya.

(*b*) The high ratio of sarcomatous to carcinomatous growths—namely, 2 : 3. The International Year Book (1929)[2] shows that the combined returns for England and Wales, Scotland, and Northern Ireland give a ratio of sarcomata to carcinomata of 1 : 17. In these figures for Europeans no mention is made whether or not melanomata are included with the sarcomata. If one combines these two types of tumours in the native the ratio becomes 1 : 1·6.

(*c*) The large number of melanomata seen in the African. Malignant melanomata in the African have been discussed in a recent paper by Sequeira and myself,[3] and require no further amplification here.

TABLE II.—*Types of Carcinoma* (277)

Type.	No. and per cent.
Glandular	141 (50·9)
Squamous celled	134 (48·4)
Basal celled	2 (0·7)

The types of carcinomata seen are given in Table II. and the distribution of the growths in Table III. In each case the percentage given is the percentage of the carcinomatous growths and not of the total malignant tumours.

TABLE III.—*Site-incidence of Carcinoma* (277)

Site.	No. and per cent.	Site.	No. and per cent.
Limbs (skin) ..	64 (23·1)	Pancreas ..	6 (2·1)
Liver, primary ..	38 (13·7)	Trunk (skin) ..	6 (2·1)
Glands (lymph) ..	29 (10·4)	Stomach	5 (1·8)
Breast	25 (9·0)	Liver (secondary)*	4 (1·4)
Lip, mouth, and palate	17 (6·1)	Abdominal cavity*	4 (1·4)
Face and head ..	15 (5·4)	Larynx, kidney, œsophagus, rectum, thyroid, bladder (each)	2 (0·7)
Genitalia male ..	15 (5·4)	Unspecified ..	14 (5·0)
Genitalia female	13 (4·6)		
Parotid gland ..	10 (3·6)		

* Site of primary growth not stated.

The types of sarcomata are given in Table IV. and the site-incidence in Table V.

TABLE IV.—*Types of Sarcoma* (178)

Type.	No. and per cent.	Type.	No. and per cent.
Round-celled sarcoma	64 (35·9)	Osteosarcoma ..	10 (5·6)
Spindle-celled sarcoma	58 (32·5)	Chondrosarcoma .	3 (1·6)
Mixed-celled sarcoma	24 (13·4)	Myxosarcoma ..	3 (1·6)
Myeloid sarcoma .	14 (7·8)	Liposarcoma ..	1 (0·5)
		Oat-celled sarcoma (mediastinum) .	1 (0·5)

TABLE V.—*Site-incidence of Sarcoma* (177)

Site.	No. and per cent.	Site.	No. and per cent.
Limbs	65 (36·5)	Breast, kidney, liver (each) ..	4 (2·2)
Glands	14 (7·8)	Eye	3 (1·7)
Mouth and jaw ..	14 (7·8)	Intestines ..	2 (1·1)
Bone (unspecified)	8 (4·6)	Uterus, vulva, spleen, lung, mediastinum (each)	1 (0·6)
Ribs and chest wall	8 (4·6)	Unspecified ..	20 (11·2)
Face and head ..	7 (3·9)		
Testicle	7 (3·9)		
Neck	7 (3·9)		
Retroperitoneal ..	5 (2·8)		

EPITHELIOMATA

From the figures given in Tables II. and III. it appears that malignant growths of the skin are of the utmost importance in the East African native. Among the glandular carcinomata 4 cases were diagnosed as tumours of the sweat glands; these taken in conjunction with 2 rodent ulcers, 59 melanomata, and 134 epitheliomata show that cancer of the covering membranes accounted for 36·4 per cent. of the malignant growths found. It is significant that although epithelial tumours are so common in the African, yet basal-celled cancer, so common amongst the white races, has only been diagnosed twice in 546 tumours. Smith and Elmes in Nigeria found 7 in 500 tumours. Yet rodent ulcers are often seen in the white population in East Africa.

The large number of squamous-celled cancers is due to the prevalence of malignant changes in chronic tropical ulcers of the leg, 73 of the epitheliomata being associated with this condition. In an attempt to investigate tropical ulcers from a histological viewpoint, a routine series of examinations was carried out. Through the courtesy of Dr. Procter and Dr. Hargreaves, of the Kenya Medical Service, 282 ulcers excised in a native reserve hospital were obtained. These were an unselected routine series removed from both sexes of all ages, the doctors concerned considering that excision followed by skin-grafting offered the best hope of a cure within reasonable time in general hospital work. In these 282 ulcers were found 1 melanoma almost devoid of pigment, 5 epitheliomata, and 3 cases in a definite precancerous condition. Thus excluding the precancerous conditions 2 per cent. of a routine series of chronic tropical ulcers were found to be malignant. The Annual Medical Report, 1932, for Kenya Colony [4] shows that among in-patients and out-patients treated at the Government native hospitals over 18,000 were seen in one year.

While examining the ulcers one was impressed with the aberrant overgrowth of the marginal epithelium. This was so striking that it is doubtful if any two observers would agree on the number showing precancerous changes. Two main factors appeared to be involved in limiting the atypical overgrowth: (*a*) the dense bed of well-developed fibrous tissue forming the base of the ulcer; and (*b*) fibrosis of the blood-vessels in the ulcer.

During the investigation it was found that 11 per cent. of the ulcers showed foreign bodies or foreign body giant cells. This must be regarded as a high incidence, for only two pieces of tissue were blocked and sectioned from each ulcer and the ulcers varied in size up to 6 or 7 inches in diameter. The foreign bodies were a clear, hyaline, structureless-looking material, and in one ulcer portions of an unidentified worm were found.

BREAST AND GENITAL ORGANS

Malignant disease of the *breast* is not uncommon in the East African native, 25 carcinomata and 4 sarcomatous growths being seen, a percentage of 5·3 of the malignant tumours. Of these, 5 carcinomata and 2 sarcomata were from males. Among the female cases there were 2 cases of epitheliomata and 1 case of Paget's disease of the nipple.

Male genital organs.—The 15 cases seen included 9 cases of epitheliomata of the penis. These were all derived from uncircumcised natives. Circumcision is practised by most of the tribes in Kenya, the operation being performed about the age of fifteen years. Wolbarst [5] states that the morbidity-rate of penile cancer in the United States is at least 2 per cent. and possibly 3 per cent. of all cancer in the male and draws attention to the rarity of the condition in the circumcised. In Kenya where epithelioma is the common form of cancer no case of this disease of the penis was found in a circumcised native.

Among the tumours of the *female genital organs* only 1 case of carcinoma of the body of the uterus was found. One case of sarcoma of the uterus was also seen. Smith and Elmes in their series only had 2 cases of cancer of the uterus and 1 myosarcoma. Thus in 502 cases of carcinomata from Africans only 3 were uterine growths. As in other organs, epitheliomata accounted for the majority of the growths of the female genitalia.

TUMOURS OF THE LIVER

Cazanove [6] states that in French West Africa cancer of the liver is commoner than cancer of any other organ. Snijders and Straub [7] found the same condition of affairs in Javanese coolies working in Sumatra. Strachan,[8] discussing autopsy findings among the Bantu races in South Africa, found the liver to be the commonest site of primary carcinoma accounting for no fewer than 37 out of 73 epithelial tumours. Smith and Elmes had 32 in their series. In the East African 13 per cent. of the epithelial tumours were of primary hepatic origin. The high incidence of this type of growth is best illustrated by autopsy records. In 1100 consecutive post-mortem examinations, the great majority of which were on patients thirty-five years or under, 24 malignant growths were found. Of these, 16 were epithelial and included 8 primary carcinomata of the liver.

Of the 37 cases seen, microscopical examination showed that 31 were liver-celled growths and the remaining 7 bile-duct in origin. The outstanding feature of the livers in which there were growths was the cirrhosis present, usually of a hob-nailed variety. This point has been noted by the various authorities quoted in this article. The relationship between cirrhosis and primary carcinoma cannot be considered a casual one, and it would appear doubtful that the cirrhosis is secondary to the new growth. In a previous paper I pointed out [9] that 67 in 100 livers, removed at consecutive post-mortem examinations from patients of all ages, showed cirrhosis of one form or another. In addition, 16 of the 100 livers exhibited fatty degeneration. Thus in considering cancer of the liver in the East African native it must be borne in mind that one is dealing with an organ extensively diseased before the onset of any malignant changes.

Of the 8 carcinomata seen on the post-mortem table none showed metastases in other organs, the growths being confined to the liver itself.

TUMOURS OF THE INTESTINES

As can be seen from Table III. malignant disease of the intestinal tract is not common. Two cases of carcinomata of the rectum have been seen and 2 of secondary nodules in the abdominal cavity, which from their histological appearances may have been derived from an adenocarcinoma of the rectum. In these 2 latter cases the site of the primary growth was not stated.

Cancer of the stomach, like gastric ulcer, appears to be rare in the East African. In the 1100 autopsies to which reference has been made only 2 cases of gastric ulcer were seen and 1 case of a healed duodenal ulcer.

GENERAL

The tumours examined have been received from native hospitals throughout Kenya and are representative of the native population as a whole. They cannot, however, be taken as statistics for the incidence of cancer. The tumours seen in the Medical Research Laboratory, Nairobi, represent only a small proportion of the tumours found throughout the Colony, and presumably the medical officers in the native reserves see only a proportion of the sick in their district. This will be appreciated when it is understood that a medical officer may have under his charge a district of 3000 square miles and a population of 300,000, and for assistance a few indifferent native dressers.

No mention has been made of the age-incidence of malignant disease in the native. Such records as one possesses are useless, since no registration of births or deaths is carried out in the native reserves and it is impossible to obtain accurate ages from the natives themselves; the figures we have represent an estimate by the medical attendant. However, personal experience and the consensus of opinion of the medical officers from whom inquiries have been made seems to show that the onset of cancer is at an earlier age in the native than in the European, the maximum age-group being 30–40 years. This may be a factor in the high ratio of sarcomatous to carcinomatous growths.

The natives in the reserves in Kenya have been touched only lightly by civilisation. They live under conditions of filth and squalor. Sanitation is almost non-existent as yet and the main food is maize meal. Meat is eaten when available, but this is rarely, since cattle are regarded as currency.

CONCLUSIONS

These observations provide further evidence against the theory that cancer is rare among indigenous peoples living under natural and primitive conditions. As yet only a negligible proportion of the population of Kenya live under "civilised" conditions; but analysis shows that malignant disease is far from rare among them. The distribution in the body differs materially, however, from the distribution recorded in the European.

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MEDICINE AND THE LAW

Diabetes Treatment by Unqualified Practitioner

AT a Camberwell inquest last week, where death was found to have been due to diabetes, the South London coroner described the treatment as "arrant rubbish" and the unqualified practitioner who had administered it as a "quack." Sir Bernard Spilsbury gave evidence that the medicine prescribed by this practitioner would have no appreciable effect; it was simply useless. The coroner explained to the jury that, had there been evidence that the treatment had shortened life, a verdict of manslaughter would have been proper. As there was no such evidence (the medicine having no more effect than so much water), a verdict of death from natural causes was returned.

The deceased, a woman aged 32, had suffered from diabetes for several years. She had originally been treated by a duly qualified doctor; he was called in again shortly before her death when she was in a state of coma and a death certificate was likely to be required. The unqualified practitioner who treated her had a plate outside his "surgery" in Peckham Rye which bore the words "Dr. William Mellor, Osteopath, U.S.A., Homœopath, India." He told the coroner that he had obtained a degree in osteopathy at the First National University, Washington, New Jersey, and was an associate of the Western University, Kapurthala, India. "Would you be surprised to hear," inquired the coroner, "that there is no such place as the Western University, Kapurthala, but merely a place which issues diplomas on payment of a fee?" Mr. Mellor replied that the information would surprise him; he had not studied in India but had sat for the examination in homœopathy in London "under the Indian Education Scheme." He explained that he called himself a doctor because of his doctorate of osteopathy; he did not practise as a physician and was not a surgeon or a general practitioner; he held a degree as doctor of medicine from the American Academy of Medicine and Surgery, Washington, but did not practise; he was also a member of the British Homœopathic Association. The coroner, in summing up to the jury, disposed somewhat summarily of Mr. Mellor's titles and qualifications. "He calls himself a doctor of osteopathy but none of the institutions to which he referred are known in the academic world as genuine places where degrees are properly given; in other words he is simply a quack." It is evident, however, that the descriptions which Mr. Mellor had adopted were found impressive by members of the public. A sister of the deceased said that Mr. Mellor had been recommended by neighbours who thought he was a qualified doctor. The preamble to the Medical Act declares the expediency of the public being able to distinguish between the qualified and the unqualified practitioner. Mr. Mellor's plate obscured the distinction.

A Bogus Major of the R.A.M.C.

The police disclosed a curious career of imposture when Richard Gerald Willoughby pleaded guilty at Andover last week to summonses charging him with having unlawfully worn a major's uniform and military decorations at South Tidworth on August 3rd. Willoughby attended a cricket match at the R.A.M.C. ground, driving up in a large car. He was dressed as a major of the R.A.M.C. and wore field boots, a sword, the Military Cross, and other war medals. After watching the cricket he asked to be directed to the officers' mess, where, while accepting refreshment, he told an officer that he had come down from Millbank in connexion with an outbreak of diphtheria. He also said that there was a lot of tonsillitis about. He was afterwards entertained at dinner at the O.T.C. camp officers' mess; here he took too much to drink and was sent back to the military hospital. Doubts having arisen about his identity, he was taken to the police station where he said he was a doctor and a retired major, but could not now call himself a doctor as his name had been struck off the Register. Research by the police failed to show that Willoughby had ever held a commission in the R.A.M.C. The records showed that he had enlisted in the Duke of Cornwall's Light Infantry in September, 1914, as Percy Seymour Kelly, changing his name to Willoughby by deed poll on obtaining a commission in the Royal Fusiliers a month later. He resigned next year, re-enlisted as Robert Kelly and soon obtained a temporary commission as Eric Patrick Cosmo Gordon O'Kelly, but was removed from the Army a few months later. Enlisting again in the Royal Dublin Fusiliers, he deserted in November, 1915. He served once more as Percy Seymour Kelly from July to October, 1918, when he was discharged as physically unfit.

He had posed in London hotels as an officer in the Canadian Rifles. He had travelled round the country as a clergyman, visiting real clergymen, and on one occasion actually preaching a sermon. He served six months' imprisonment in America for impersonating a British officer, and had been imprisoned in Canada for posing as a doctor. He had obtained a situation as a chartered accountant at £1000 a year. He had described himself as Dr.

Robert Beatey Martin in Panama, and had obtained an appointment in that name as ship's surgeon in a British liner. He was landed at Singapore with malaria and, as Dr. Martin, escorted to England a judge who was ill. In 1932 he was sentenced at the Old Bailey to two years' imprisonment for false pretences and indecent assault. It was a remarkable history of fraud, and the Andover magistrates awarded him three months' imprisonment and £5 fine for his escapade at South Tidworth last month.

Puerperal Melancholia and Criminal Responsibility

Newspaper paragraphs last week described proposals for reforming the law of infanticide. Women who kill their babies while suffering from melancholia following childbirth should, it was suggested, be tried by a committee of alienists and psychiatrists instead of by an ordinary criminal jury. The proposals envisage the mother's mental state as partly an economic and political problem. It is hinted that the increase in infanticide may be due to unemployment, the mother being naturally worried at the extra addition to the family when the father is out of work.

Opposition may be expected from the judges, the legal profession, and the Home Office. It will be pointed out that two post-war statutes have operated, and were intended to operate, against mothers being found guilty of murdering their new-born children. The Infanticide Act of 1922 and the Infant Life (Preservation) Act of 1929 enable the most lenient view to be taken. The reformers seem scarcely to have given Parliament credit for the change in the law whereby the disturbed mental state of a mother within a short period after childbirth is now taken specially into account. Those concerned with the administration of justice are jealous of handing over the duties of courts to lay tribunals: they are sure to demand that facts shall continue to be found by magistrates and juries under a system which does not preclude the assistance of expert witnesses. Everyone will be sympathetic towards the anxieties of the mother at childbirth, but there may be some difference of opinion about the alleged increase in infanticide. The latest criminal statistics (those for 1933) suggest that the number of persons annually tried for infanticide under the 1922 Act is falling rather than rising. There was one case under the 1929 Act in 1931; there were no cases in 1932 or 1933. The coroners' statistics for 1933 show that 336 inquests were held on the bodies of newly born children. These were cases where inquests were adjourned under Section 20 of the Coroners (Amendment) Act, 1926, and not resumed, prosecutions being conducted in the ordinary criminal courts. Out of the 336 cases there were 13 verdicts of wilful murder, 2 of manslaughter, and 3 of infanticide. There is nothing to show the relation of these figures either to puerperal melancholia or to unemployment. It is a point with which the official editor of the criminal statistics might deal in next year's volume.

Inquest on Prehistoric Man

The *Times* of Sept. 5th recorded the holding of an inquest in Ireland upon human remains found at Mullaghneish mountain, near Londonderry, and estimated to be over 3000 years old. The evidence indicated that the remains were those of an Irish chieftain of the Bronze Age. They consisted of a portion of a rib, a tooth, and skull bone; they had been roughly cremated and were found in a bowl-shaped urn buried in a vault-like structure of stone in a bog; a substance of the nature of clay within the urn was apparently food to sustain the departed spirit on its journey. The coroner had taken the view that there was a question of ownership. The urn and remains had been removed to the Belfast Museum and he had served a warrant on the curator for their return; he thought the police should have the custody till the ownership was established. An English coroner would probably have left the question of ownership to another court; this was not treasure trove. The coroner's concern is with a dead body, and there are ancient legal difficulties about property in a corpse. The discovery of these ancient remains recalls the fact that there has occasionally been a pious practice of reinterring Stone Age, Bronze Age, or Iron Age skeletons in churchyards and cemeteries. Where piety has thought it necessary to "give Christian burial" to pre-Christian relics, it has been a necessity that must have made strange bed-fellows. It seems almost as incongruous to assert a coroner's jurisdiction over the prehistoric dust upon the shelves of a museum.

BRITISH ASSOCIATION

FOR THE ADVANCEMENT OF SCIENCE

Chemotherapy of Malaria

OPENING the discussion by the chemistry section of the Association on the chemotherapy of malaria, Colonel S. P. JAMES, F.R.S., referred to the distressing effects of the malaria epidemic and famine in Ceylon. The area affected was not as large as Yorkshire, but the cost of relief measures was about £350,000, and during the six months from November to April 14½ tons of quinine, costing £50,700, was used. About £20,000 was also spent on Atebrin. The epidemic had reminded the world once again that no royal road or short cut to the prevention of malaria had yet been found; during recent years similar reminders had come from British India, Malaya, East and South Africa, Nigeria, the Sudan, Mauritius, Trinidad, Barbados, and other British territories overseas. In view of these and other examples it had to be admitted that, despite some remarkable discoveries, existing knowledge on the prevention of malaria was not sufficient. Direct war on the malaria-carrying mosquito was too difficult and too costly for general use, and quinine had failed to maintain its old reputation as the sovereign remedy which meets all needs. More knowledge was needed in many different directions, one of them being the much neglected subject of chemotherapy. Quinine satisfied the practising physician because it promptly stopped most clinical malarial attacks; but it had the grave defects of not preventing infection of either the human host or the mosquito and of not preventing relapses. To discover and prepare drugs which would be effective where quinine failed was the chief aim and object of antimalarial chemotherapy. In Germany two synthetic antimalarials, Plasmoquine and Atebrin, which to a considerable extent fulfilled that requirement, had already been discovered, and now it was to be hoped that England would make adequate arrangements to pursue the subject in the same intensive way and with the same objects in view. Up to the present, said Colonel James, the chemical industries of this country had not concerned themselves with the matter, and the Government grants which had been allotted during the last few years to assist antimalarial chemotherapeutic research had amounted to less than a two-hundredth part of the Empire's annual bill for quinine.

Colonel James then elaborated, with examples, the defects of quinine and the directions in which quinine therapy could be supplemented by atebrin and plasmoquine. It was clear, he said, that the discoveries made by Prof. W. Schulemann and his colleagues at Elberfeld had placed in our hands new antimalarial weapons of great power and precision, but there was still ample scope for further research in this and other countries.

Prof. **SCHULEMANN** then addressed the section on methods of chemotherapeutic research as exemplified by the antimalarial drugs. The successful production of these drugs at Elberfeld had, he remarked, been largely the result of the invention by biologists of new methods of testing the antimalarial properties of synthesised substances. There had been a growth of sympathetic understanding between chemist and biologist with the proper blend of intuition and organisation, and this had spelled progress which could never have been reached by trial and error or purely empirical methods. Plasmoquine, he said, was the thirty-fifth in a certain series to be tried out, and since 1924 only one other effective antimalarial substance had been found. While the operation of these antimalarial weapons was still obscure he surmised that the explanation might be found in the chemistry of surfaces; it had been found that mice could be killed if given drugs on an empty stomach, when they suffered no ill-effects from the same drugs given after a meal.

Prof. **ROBERT ROBINSON**, F.R.S., followed with an outline of the methods employed for the synthesis of potential antimalarials by himself and his colleagues, and discussed some of the results from the point of view of the relation between constitution and antimalarial action. He also directed attention to the pressing need for coöperation between chemists and biologists in a national institute for research in chemotherapy.

Dr. **P. TATE** (for Prof. **D. KEILIN**, F.R.S.) and Dr. **M. VINCENT** then submitted a joint communication on the chemotherapy of bird malaria and its importance in relation to the therapeutics of human malaria. They pointed out that bird malaria was a valuable means of testing the antimalarial action of new synthetic compounds, since many of these act in a similar way in human and in bird malaria. Routine tests on birds are made on asexual stages of the parasite transmitted by direct blood inoculation, but by utilising mosquito infections it is possible to determine the action of a compound on gametocytes and on sporozoites. The results of work on bird malaria are not always applicable to human malaria, but so far every synthetic compound of value in human malaria had been discovered by means of preliminary tests on bird malaria.

Dr. **T. A. HENRY** spoke on antimalarial drugs of natural origin. He said that from natural drugs having a local reputation as remedies for malaria—e.g., the alstonias of Australia, India, West Africa, and the Pacific Islands—a group of alkaloids had been isolated which might be antipyretic but were devoid of antimalarial activity. In order to determine the relative activities of the various cinchona alkaloids, the eight principal alkaloids had been prepared in a pure state and from tests in bird malaria had been arranged in the following descending order of activity: (1) hydroquinine, (2) quinine, (3) hydroquinidine, (4) cinchonidine and quinidine, (5) cinchonine, hydrocinchonine, and hydrocinchonidine. In general it could be stated that any change which diminishes the basic character of such an alkaloid as quinine reduces its antimalarial activity, though it may result in the development of pharmacological activity of another kind.

Sir **RICKARD CHRISTOPHERS**, F.R.S., then read a paper on chemotherapeutic effect as a combination through a basic side chain. He said that a usual conception of chemotherapeutic effect was molecular fit. The chemical nature of such fit was often not very clear, but the necessity of a basic side chain for linkage to protein was sometimes referred to. All antimalarial drugs natural and synthetic had such side chains. With a view to studying such combination, observations had been made upon absorption by red cells of some simple acids and bases, using critical hæmolysis of a given quantity of red cell substance and electrometric determination of the pH as guides to the reaction. It was found that lysis of the cell was brought about through formation of a critical amount of "protein salt," which amount was the same for all acids. With this is associated a fraction due to "hydrolysis" of the salt, which is greater the weaker the acid. This necessitates a larger dose in the case of some acids than others. This "hæmolytic dose" can be calculated with considerable approach to experimental findings. "Hæmolysis" is associated with a critical relation of iso-electric to ionised protein and a characteristic pH. Other critical events—e.g., lethality, if caused by ionisation—can be studied in a similar way.

Prof. **WARRINGTON YORKE** spoke strongly of the neglect in this country of research in chemotherapy.

AN AMBULANCE SERVICE FOR ETHIOPIA

BY JOHN M. MELLY, B.M. Oxon., F.R.C.S. Edin.

BEFORE describing the ambulance service which is being organised in this country to attend to the sick and wounded behind the lines of the Ethiopian army in the event of war with Italy, something must be said about the present state of medicine in Ethiopia and her existing medical resources.

THE MEDICAL RESOURCES OF ETHIOPIA

Whereas the Government has in recent years instituted a number of schools in various parts of the country where a remarkably efficient and high standard of education is maintained, no attempt has as yet been made to train native medical men. I was, however, in Addis Ababa, actually discussing with the Emperor a scheme for the foundation of a large modern hospital and medical school, when the present crisis arose. Architects' plans of a 300 bed hospital, incorporating the latest ideas in hospital construction and equipment, had been drawn up, and a complete schedule of medical education had been worked out. It had been decided that the site of the hospital, and of a medical school to accommodate 50 students, was to be at Harrar, the second largest town in Ethiopia. This scheme, of course, has had to be postponed, and in the meanwhile the inhabitants of Ethiopia, which is nearly as big as France and Spain put together, are served only by their native doctors and the European medical missionaries in the country.

The native doctors have undergone no training whatsoever in the European sense of the word. The secrets of their remedies are jealously guarded, and handed down from father to son. There is no doubt that they are in possession of powerful drugs and medicinal applications derived from local plants, but these are constantly misapplied and often do more harm than good. One extract, for example, the identity of which neither I nor any other European has yet been able to discover, apparently exerts a violent but curiously selective action upon the tissues. It appears to eat away rapidly and to a considerable depth the tissues to which it is applied, leaving a clean, granulating surface. But the remarkable thing is that this extract is said to have no action on the vessels and nerves, these remaining completely untouched. A native recently came to a mission hospital with a massive sarcoma of the neck and operative treatment was advised. He preferred to return to his native doctor who applied this extract to the whole of the affected side of his neck. He was seen at the hospital a few weeks later, and the entire tumour had apparently been eaten away, leaving a deep granulating wound in which the vessels and nerves stood out as though cleaned by careful dissection. Reports of a leaf possessing these same selective properties have come, too, from other sources. I understand that some years ago, while Sir Auckland Geddes was travelling in Uganda, close to the Ethiopian border, a similar story reached him, but that he was frankly incredulous.

In Addis Ababa there are four moderately well-equipped missionary hospitals, the largest containing one hundred beds; and there are several missionary clinics scattered through the outlying parts of the country. In Addis Ababa also the Emperor has built and supports, out of his own private purse, a small hospital equipped with a modern operating theatre and X ray plant. It is run by a capable Swedish surgeon, and two Swedish sisters, who have trained a number of very efficient native nurses. Altogether there are in the country at the most about 500 hospital beds available for the ten millions of population. Practically all of these are worked by various missionary societies.

COMMON DISEASES

The disease which probably takes the largest toll of life is typhus fever. Malaria is common in the low country, where the inhabitants have developed a considerable immunity, but Addis Ababa is situated at a height of 8000 ft. above sea-level, and consequently it and the surrounding plateau are malaria free. Tape-worm is practically universal amongst the adult population owing to their taste for eating raw meat. They deal with the situation by taking an exceedingly powerful purge, derived from local herbs, regularly once a month. Relapsing fever is common, and dysentery is very frequent, especially among the European inhabitants, unless the strictest precautions are observed. Venereal disease, both syphilis and gonorrhœa, is rife throughout the whole land, and it is said that 90 per cent. of the adult population are affected. The organisms in both cases appear to be greatly attenuated, and the tertiary forms of syphilis are rarely seen. Infant mortality under one year of age in Addis Ababa—the only place where any attempt has been made to estimate it—is reputed to be over 50 per cent. Apart from these conditions, however, the cases seen at a hospital in the capital are very similar to those seen daily in any out-patient department in London.

The native doctors—perhaps mercifully—do not practise any form of surgery; and the Ethiopian army is wholly without a medical service. In the last few weeks the skeleton of an Ethiopian Red Cross Society has been formed. The personnel, presumably, consists of one or two missionary doctors, who can ill be spared from their already understaffed hospitals, and the dozen or so Ethiopian girls who have been trained as nurses. The fighting would be, in the early stages at least, many weeks' journey from Addis Ababa, and if the Ethiopian Red Cross Society should send its personnel to attend to the wounded on the field it would of necessity leave the hospitals practically without staff. It is probably intended, however, that the doctors should remain at their hospitals and there look after any wounded who might ultimately find their way back to Addis Ababa. Meanwhile the plight of the wounded on the field of battle would beggar description. The whole country is overrun with hyenas and jackals, apart from the larger wild beasts, and there is no doubt that those wounded who survived till night falls would become a prey to these animals.

REASONS FOR THE ORGANISATION OF AN AMBULANCE SERVICE

It is for this reason—because Ethiopia has virtually no means of looking after her casualties—that an ambulance service for Ethiopia is in the process of being formed.[1] Some two months ago a number of people, most of whom have had personal knowledge of the country and can consequently visualise the more vividly the appalling prospects, formed themselves into a committee to organise medical assistance for Ethiopia in case of war. The object of the service is purely humanitarian and without political bias. The organisation will work in close coöperation with the Ethiopian Red Cross Society, and to this end Dr. T. A. Lambie, who has worked in Ethiopia for nearly thirty years and who is on the committee both of this organisation and of the Ethiopian Red Cross Society, is already on his way to Addis Ababa.

The International Red Cross Committee in Geneva has been frequently consulted and has been most helpful with advice and encouragement. They have expressed a wish to keep in close contact with the committee in London, and this is being arranged. If war breaks out and the British Red Cross Society should decide to take action, it is proposed that the ambulance service now being formed should be incorporated with them in whatever way they may think best, and its personnel and matériel and any unexpended funds would be placed at their disposal. The British Red Cross Society have stated that any steps which they may ultimately take to help the Ethiopian Red Cross Society in succouring the sick and the wounded will be taken in conjunction with the committee of this organisation. Further, the Ethiopian Minister in London has given his assurance of full authorisation by the Ethiopian government under Articles 10 and 11 of the Geneva Convention.

In the meanwhile a great deal of preliminary work and organisation has been done. Subcommittees dealing with personnel, medical equipment, commissariat, and the exceedingly difficult problem of transport, have been hard at work for some weeks. Volunteers are being interviewed daily and all preparations are being made in case of war.

PLANS

It is intended to disembark at Berbera in British Somaliland and proceed by lorry via Hargeisa and Jigjiga to Harrar where the first field hospital will be established. Casualty clearing stations will be pushed out south-eastwards from there. The line of retreat will probably be due west from Harrar in the direction of Addis Ababa, and the next situation for the field hospital is expected to be Asba Tafari in Chercher Province. An advance liaison officer under orders of the transport committee is proceeding to Berbera immediately to make preliminary arrangements there and at Harrar and along the road between the two. Since it is impossible to take any transport into Ethiopia from the Sudan till early next year owing to the condition of the roads after the rains, the only remaining route of entry, when the advancing Italians cut the Berbera-Harrar line of communication, is from Kenya via Moyale to Addis Ababa. The chief transport officer has already flown to Nairobi to open up this route and to form a committee there to deal with supplies and transport from that end.

A few more medical men are still required, but if they and sufficient funds are forthcoming in the meanwhile, it is hoped that the expedition may sail before the end of this month.

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[1] Details are given in our advertisement columns, p. 45.

CORRESPONDENCE

THE DOCTOR AS ADMINISTRATOR

To the Editor of THE LANCET

SIR,—On its opening page the *Hospital* for September comments on the leading article entitled The Doctor as Administrator in *The Lancet* of August 10th and in very definite terms supports the appointment of lay administrators. Speaking of the medical staff of hospitals the *Hospital* remarks: "As such, their influence is very great, and no lay committee, or lay administrator, is in a position to say them nay in matters affecting medical practice." One of the chief objections to the principle of lay administration is admitted in this comment. It is surely not in the public interest that a body of experts should have all the power with regard to the purchasing of new and expensive instruments or apparatus which, often, the hospital can ill afford, and I quite agree that a lay administrator cannot safely disregard a request from a member of the medical staff. A medical superintendent, on the contrary, can, with his professional knowledge, discuss the request intelligently with one eye on the bank balance and the other on the medical and surgical requirements of a progressive hospital.

There has been much discussion of late on the question of lay versus professional administrators for hospitals. Will anyone deny that a medical man, with average business instinct and acumen, has a distinct advantage over the lay person by virtue of his having, in addition, professional training?

I am, Sir, yours faithfully,
DAVID G. MORGAN.

Llandough Hospital, Cardiff, Sept. 7th.

THE DOSAGE OF ALKALI

To the Editor of THE LANCET

SIR,—I was glad to read the letter of Dr. Geoffrey Evans in your last issue,* for, in addition to the value of the suggestions which he makes, it serves to call attention to Dr. Oakley's admirable article. Dr. Oakley showed that alkalosis is far from rare in intensive alkali treatment, and Dr. Evans replies, in effect, that it is unknown if a dose of alkali is used which is adequate without being excessive.

When Dr. Oakley's article appeared I wrote to him pointing out that in all of the cases in his article (four out of seven) in which the hæmoglobin percentage was mentioned a severe degree of anæmia (ranging from 30 to 57 per cent. hæmoglobin) was present, and that recent experience of my own had convinced me that in the development of alkalosis under alkali treatment the anæmia was the significant ætiological factor. I instanced a case in which a patient suffering from pyloric ulcer and hæmatemesis developed alkalosis under treatment. I did not at that time recognise the symptoms as such, but they were, in fact, quite characteristic. My attention was concentrated on the patient's anæmia; her hæmoglobin was only 32 per cent., but as, under appropriate treatment, the percentage of hæmoglobin increased to over 70 per cent. the symptoms of alkalosis cleared up entirely, and this in spite of the fact that the dose of alkali was maintained at exactly the same level.

Dr. Oakley's reply was interesting, for he explained that there was a sound biochemical reason for this clinical observation, since the hæmoglobin itself plays an important part in the maintenance of the acid-base equilibrium of the blood. Moreover, he had not referred to these facts in his article because he was himself elucidating the matter by giving alkali to anæmic and non-anæmic patients with peptic ulcer and observing the variations in the alkali reserve in both groups produced by the same doses of alkali.

While we await the result of this research it would appear wiser to adhere to some such prescription of alkali as Dr. Evans suggests, especially in treating patients who have had serious bleeding from peptic ulcers and are therefore anæmic—a clinical combination which is sufficiently common.

I am, Sir, yours faithfully,
Derby, Sept. 9th. DOUGLAS HUBBLE.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—The interesting paper on a unique form of rectal pain which Dr. Hess Thaysen contributed to THE LANCET of August 3rd emboldens me to offer here the abbreviated history of one instance of the malady in which both cause and cure have been established.

Dr. X. Y. had long been intimately acquainted with this entity, but being in matters of personal indisposition confirmedly ostrichous (*terms, Sir, no more inadmissible* than Dr. Thaysen's "*proctalgia fugax*"), he waited 16 or 17 years before requesting a surgical colleague to examine him. This gentleman finding nothing of surgical interest suggested examination by a urologist, which latter in turn fell at once to massaging the prostate. Now the patient is not a fellow of famous faith in placebos, however well-intentioned their administration, so after two of these séances he thanked his professional friend most kindly and took refuge in lonely pondering. For many years I had been encountering him early each morning, but despite *these frequent meetings our relationship* had never progressed beyond the point of rather self-conscious and hurried mutterings when we met. I must confess that I felt he always thought me a little dull in most things, and in matters medical by no means the purist he would have liked. But *suddenly one morning* he quite overcame his diffidence or dislike and asked my professional opinion regarding this complaint of his. Hearing him recount the symptoms it seemed to me that one might connect these seizures with those occurring in certain types of "pseudo" *angina pectoris*. When I expressed what was in my mind his conduct amazed me, for he slapped me intimately on the thigh and exclaimed, "Why that's it, to be sure! Nothing could be more simple. You merely quit smoking and—well, there you are!" At any rate, *he did stop smoking and* within the week was cured.

This occurred about fourteen months ago, and I continue to see him regularly. Twice he has taken up with the weed again, and in each instance the old tormenting trouble has promptly returned. At the present writing he has not smoked since the first day of July; he is completely symptomless and vows to me that this time his resolution is of the staunchest. But, alas, I am beginning to know the poor chap so well!—I am, Sir, yours faithfully,

HARRY BECKMAN.

Marquette University, School of Medicine,
Milwaukee, Wis., U.S.A., August 26th.

To the Editor of THE LANCET

SIR,—A number of correspondents have written to you about this newly described condition. A patient of mine, male, aged 24, has been greatly troubled with it off and on for four or five years; this case is a little different from the others described in your columns because he may have an agonising rectal spasm or painful penile erection, or both. He came to me recently with both, and I gave him marked relief by blowing 20 puffs into his rectum with a Higginson syringe. The condition was not cured, but the residual pain disappeared at once when I gave him 3 minims of amyl nitrite. I feel justified in dashing into print with only one case to the credit of this drug, because its effect was so dramatic, and because it is so easily applied. A few seconds with a capsule and a handkerchief at the side of the tennis court, or in the cloak room at a dance, and all is well, and he can rejoin his party.

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* Dr. Evans wishes to correct 47 grammes to 37 in line 20 of his letter.—ED. L.

I am, Sir, yours faithfully,

East Grinstead, Sept. 3rd.   W. H. MARSHALL.

TREATMENT OF ECLAMPTIC TOXÆMIA

To the Editor of THE LANCET

SIR,—I write to let you know of good results we have been getting in the treatment of eclampsia and pre-eclampsia at the Royal Lying-in Clinic and Midwifery School at Szolnok.

It is now ten years since Lazard introduced the treatment of pregnancy toxæmia by intravenous injection of magnesium sulphate and glucose. The effect of this treatment is primarily sedative; it controls convulsions far more surely than the Stroganoff régime—indeed, I do not remember a single case in which it has failed to stop them. It also lowers the blood pressure and has a diuretic influence. This threefold action has been responsible for excellent results, but our experience of the past two to three years suggests that these can be further improved by giving a diet rich in carbohydrates and vitamin C. This is less trying to the patients than is Volhard's "starvation diet," and while the glucose may afford valuable support to the liver in its work of detoxication, the vitamin C may counteract the factors which cause the internal hæmorrhages often found post mortem.

In pre-eclampsia the patient received each day 400 grammes of milk, with lemonade made from six lemons and 200 g. of sugar (making 1·5 litres divided into six portions). No other food was given. The results, as I have said, seemed to be improved, and in view of F. G. Dietel's demonstration (Arch. f. Gynäk., 1935, clix., 94) of serious vitamin-C deficiency in eclampsia I decided to add this vitamin in the form of ascorbic acid to the injections of magnesium sulphate and glucose. Prof. Szent-Györgyi, who first isolated this substance, puts the average therapeutic dose at 0·05 g. in 24 hours, but we know, from Vogt's successful use of it in the treatment of excessive uterine hæmorrhage in girls, that doses of 0·1 to 0·12 g. can be given without damage and with good effect. In consultation with the firm of Gedeon Richter Ltd., I decided to include 0·0125 g. of Proscorbine Richter in each ampoule of magnesium sulphate and glucose. Thus in a mild case of eclampsia if four injections sufficed to dispel all danger the patient would receive 0·05 g. ascorbic acid, while in more severe cases, requiring eight doses in the 24 hours, she would get not more than 0·10 g., and that in *dosi refracta*. The 20 c.cm. ampoules supplied to me by the firm for purposes of investigation contain 20 per cent. of pure glucose and 10 per cent. of magnesium sulphate, with 0·0125 g. of proscorbine.

The rapidity with which the combined remedy acts is really remarkable. When it was used in our usually very severe cases of eclampsia (with blood pressures of 180, 170, and 150 mm. Hg, widespread œdema, and in one case commencing œdema of lungs) albuminuria ceased, generally within three to four days, the œdema went down quickly, and the blood pressure was in all of them normal four or five days after confinement.

Since the adoption of this combined remedy we have treated 14 cases of pre-eclampsia. None of them had blood pressure under 130 and there were two with a blood pressure of 200/220. With the exception of one case (B.P. 200) in which the pressure could only be brought down to 180 we succeeded without the induction of labour; in that case labour was induced and the treatment continued, with the result that the outbreak of convulsions was avoided and the woman left the hospital quite well. We used the combined remedy in 11 of 12 cases of developed eclampsia; the other case was admitted in a hopeless condition with severe œdema of the lungs, and before anything could be done a severe convulsion brought the end. Of the 11 cases 9 were saved and 2 died of their eclampsia, though the convulsions were controlled.

If we consider the extreme severity of eclampsia in Hungary, and especially in Eastern Hungary, and the fact that nearly all the cases were transferred to us from the country (being chiefly the worst cases) the new treatment does seem to improve the outlook for the future.—I am, Sir, yours faithfully,

Szolnok, Hungary, Sept. 6th.   EUGÈNE DE KONRÁD.

WHOOPING-COUGH SKIN-TEST

To the Editor of THE LANCET

SIR,—Since the publication in your issue of August 17th of the article by Dr. Paterson, Dr. Bailey, and myself it has been pointed out to me that we do not specifically state the dose of pertussis vaccine normally used for the skin-test, the strength of the vaccine employed in the test, or the source from which the vaccine is obtainable. We should be glad therefore if you would clear up these points by publishing the following:

1. The intradermal dose for the skin-test is normally 0·1 c.cm., but it has been found in some cases that a smaller dose such as 0·05 c.cm. may give a positive result more easily read than in the case of the larger dose.
2. The vaccine for the skin-test is used at full strength (10,000 million bacilli per c.cm.) as sent out by the manufacturers.
3. The vaccine (Sauer) is prepared by Eli Lilly and Co., Ltd., and is obtainable from any pharmacy in this country.—I am, Sir, yours faithfully,

R. G. WALLER.

John Burford Carlill Pathological Laboratories,
Westminster Hospital, S.W., Sept. 6th.

ADHESIVE STRAPPING AND THE PATCH-TEST

To the Editor of THE LANCET

SIR,—I am somewhat perturbed by your annotation of August 17th on elastic adhesive strapping, particularly in the treatment of gravitational leg ulcers. I am perturbed because, judging from six years' experience in my varicose vein clinic, the dermatitis I encountered has been negligible. In this clinic all the varicose ulcers are treated with Elastoplast—more or less according to the Dickson Wright technique: and all heal rapidly with monotonous regularity. Occasionally (say 3 per cent. of cases) a little dermatitis remains on the removal of the bandage. In very mild cases these are dabbed with calamine lotion and a further elastoplast is immediately applied. In a few cases a calamine dressing is put on for 24–48 hours and then a new elastoplast bandage is applied. I have only had five cases of serious allergic dermatitis among over 4000 in which elastoplast has been applied. In three of these the eczema was confined to the legs; two had generalised allergic eczema. In every case the eczema had cleared up in six weeks.

No treatment is free from snags. The elastoplast treatment for varicose ulcer is so sure and swift, so immeasurably better than Unna's paste bandages, that the small risk of dermatitis is, in my view, negligible. Your annotation may suggest to some the possibility of abandoning elastoplast and the return to a more primitive and far less successful line of treatment. I write to ask these wavering venologists not to retrace their steps from the heights which elastic adhesive bandages have enabled them to conquer.—I am, Sir, yours faithfully,

Liverpool, Sept. 2nd. STUART MCAUSLAND.

RAW EGGS FOR INSOMNIA AND NEURASTHENIA

To the Editor of THE LANCET

SIR,—I would like to draw attention to the value of raw hen's eggs in conditions of nervous debility and irritability and especially as a remedy for insomnia. I have found them remarkably helpful in cases of the kind termed "neurasthenia" in which, without discoverable cause, there is undue fatigue, emotional imbalance, and often symptoms referred to the heart, stomach, or bowel. On an egg régime a number of patients who had previously exhausted the resources of medical treatment have reacted rapidly and recovered within a month from states bordering on invalidism. Most of those I have treated in this way during the past five years have been males between the ages of 18 and 30, and the following cases may be briefly described to illustrate the results.

1. A Burmese, aged 24, a vegetarian, complained of intractable insomnia for the previous four years. He was fairly well built and no organic trouble could be detected. His symptoms conformed to the classical picture of neurasthenia and need not be further detailed, except to say that his chief disabilities were inability to concentrate and insomnia and that occasionally he suffered from writer's cramp. Insomnia was the most distressing feature, and he was forced to have recourse to hypnotics, including bromides, chloral hydrate, paraldehyde, and morphia. These induced a non-refreshing sleep so long as they were used, but sleeplessness returned when they were discontinued. When I met the patient he was a mental and physical wreck, on the verge of suicide. He had tried almost every remedy that he could lay his hands upon, not excluding psychotherapy. In this predicament I could suggest nothing special, but just advised him to take some hen's eggs; and since his digestion was bad I recommended him to take them raw. He was to begin with eight eggs the first day; six on the second; four on the third; and two on each successive day. The eggs were to be taken in the morning before or after breakfast. The result was dramatic. He said that he had good sleep for the first time for four years and his mental concentration had greatly improved.

As this seemed interesting, it was decided to experiment on him with the following results. Insomnia returned if the eggs were discontinued. The quality and quantity of sleep was proportional to the number of eggs taken. Two eggs produced the same amount of sleep as 40 grains of bromide. The eggs, as mentioned, were taken in the morning. He felt sleepy during the day, but actually fell asleep during the night, the sleep being excessive and dreamless during the first few days as if compensating for the previous insomnia. The number of eggs had to be increased if there was greater mental or physical exertion. The eggs seemed to act only if they were taken raw. The effect was not due in any way to the caloric value of their protein, since equivalent or greater quantity of meat or other protein had no effect whatsoever.

After about four months the patient could sleep without taking eggs daily—two eggs two or three times a week being sufficient—but the sleep was always better on the day he took eggs. As he gradually recovered it was found that the hypnotic effect of eggs was manifest only if he had had insomnia the previous night. The egg treatment ended after two years, the patient having made a complete recovery. He gets insomnia only if he takes severe exercise or indulges in excessive mental exertion. A couple of eggs restores his normal sleep.

2. A Chinese, aged 30, complained of palpitation and insomnia of about three years' duration. His main trouble was that he did not fall asleep until midnight or 1 A.M. and was wide awake again by 3 or 4. No organic trouble could be detected. He was put on eggs and he improved rapidly.

3. An Englishman, aged 23, living in Cambridge, complained of intractable constipation coupled with insomnia. The trouble began when he was 18 years of age. He began to be sleepless, forgetful, and strange in manner for about a fortnight, after which he was admitted to a mental hospital, where he presented signs and symptoms of dementia præcox. He could not sleep without drugs; he was obstinately constipated and had to be relieved by enemas at first and aperients later. He was kept in hospital for about six months, and had a further month's rest before starting work. For two years he had to be relieved occasionally by salts. At the age of 21 he again had an acute relapse and was admitted to the mental hospital for dementia præcox as before. He was discharged after about three months, aperients still being required. His condition generally became aggravated each summer when he suffered from restlessness, insomnia, and fatigue, becoming unfit for much physical or mental exertion, as if on the verge of an acute relapse as before. I met him when he was 23. He was put on eggs and a few days later was able to do without aperients. He has recovered his general health and the insomnia has also disappeared. He has been taking eggs for the last nine months and has not once taken an aperient. This has been his first summer during which nothing untoward has happened; he has been capable of more physical and mental exertion than ever before, and is like any normal person. Till about eight months after he began to take eggs, the constipation usually returned if they were discontinued; but now he only takes them on alternate days or about twice a week.

4. Another Englishman, aged 32, complained of insomnia, the cause of which seemed excessive worry through business difficulties. He has been relieved by eggs. They induce diarrhœa in him, so that their use has to be stopped occasionally.

5. An Indian, aged 25, living in Burma, complained of obstinate constipation, lack of concentration, and insomnia of a year's duration. No organic cause could be detected. He was put on eggs and reported recovery after three months.

6. An Englishman, aged 20, and a Burmese student, aged 19, complained of great physical and mental exhaustion after excessive sexual indulgence. Both made a complete recovery with eggs.

7. An Englishman, aged 43, living in Cambridge, had suffered from insomnia for seven months. He also had constipation, which had to be relieved by a daily dose of salts. (It will be noticed that constipation is regularly associated with insomnia.) No cause could be assigned to the insomnia except business worry. Previously he had slept for seven or eight hours each night, but now his sleep had been reduced to two or three. If he went to sleep at 11 P.M. he was generally awake at 1 A.M.; if he went off at 1 A.M., he would be awake at 3. He had tried all sorts of remedies without avail. He was advised to take four eggs daily, with the result that he recovered his normal sleep on the third day of treatment and said he was perfectly fit for his work. His constipation has also disappeared.

In several cases a history of excessive sexual indulgence has been elicited. Mental and sexual activity seem to bear an inverse ratio one to another:

when the former increases the latter diminishes, and vice versa. A possible explanation is that the testes and nerve-cells alike require some substance which is liable to be deficient, and my own observations suggest that the deficiency is made good by administration of raw eggs. If this is true one would suppose that ingestion of large quantities of raw hen's eggs by a normal person might lead either to excessive testicular activity or increased mental activity. This is found to be so. In India eggs are generally considered to have an aphrodisiac effect, and in normal persons they increase the frequency of seminal emissions unless hard mental (or physical) activity makes countervailing demands. It is found that ingestion of eggs averts fatigue, and students preparing for examination, and athletes, report favourably on their use for this purpose. The effect seems to be more obvious—and sometimes dramatic—in exhausted people, especially those who give a history of excessive sexual intercourse.

In view of these findings I would strongly urge the wider use of raw eggs in clinical practice and also investigation into the possibility that they contain some substance with a specific effect, which could be extracted in concentrated form. To a certain extent at least this substance seems to be destroyed by heating. In treatment it is essential that the eggs be taken in the morning.—I am, Sir, yours faithfully,

Cambridge, August 29th. I. SINGH.

THE TREATMENT OF EPIGASTRIC HERNIA

To the Editor of THE LANCET

SIR,—For the past five years I have been successfully treating epigastric hernia without having recourse to the open operation. I inject the hernia instead with 2 c.cm. of a 5 per cent. solution of quinine urea hydrochloride. This obliterates the blood-vessel which is the invariable concomitant of an epigastric hernia, causes the pledget of fat to be ultimately absorbed from lack of nutrition, and leads to sclerosis with subsequent obliteration of the small hernial opening. It is strictly an office procedure and the number of treatments necessary to obtain a cure are few. If there is a subsequent recurrence one or two more injections usually suffice. This method does not necessitate any loss of time from work, which, in this day and age, means a good deal to the patient; in addition, the financial saving is, of course, considerable.

I was led to adopt this treatment by observing that a so-called epigastric hernia really consists of fat forced through the small opening in the transversalis fascia in the linea alba made by a perforating blood-vessel, together with the blood-vessel itself. There is never a distinct hernial sac, and if one is careful while operating to remain in the mid-line the abdominal cavity will never be opened. The reason why epigastric hernia is so seldom diagnosed is simple. In ordinary palpation of the abdomen it is the surgeon's aim to obtain complete relaxation of the abdominal wall. The exact opposite is necessary in order to demonstrate an epigastric hernia. With the patient lying supine, he is directed to lift the head and shoulders off the examining table so as to put a strain on the abdominal muscles. This will cause a slight divarication of the recti muscles. Now gently palpate with the tip of the examining finger the whole length of the linea alba from the ensiform cartilage to the umbilicus. If an epigastric hernia is present a small depression will be found containing a small soft mass which is fairly tender on even light pressure.

If the onset of epigastric hernia is acute there may be extreme pain and even some abdominal rigidity—the latter however being more apparent than real. I remember seeing a man who was about to be operated upon for a supposed perforated gastric ulcer. He had previously had two other abdominal operations—one for removal of a so-called chronic appendix. His onset of symptoms was sudden and extremely acute, with vomiting, pain, and apparent rigidity. There was however no rise of temperature or pulse-rate, no decrease of liver dullness, and no alteration of the leucocyte count. Careful examination showed a small epigastric depression extremely tender to even light pressure. I injected some novocain into the area and in five minutes he was free from distress. Needless to say, his abdomen was not opened. There is often associated with epigastric hernia a dragging pain described as if the "back were pulled forward into the stomach," which causes the patient to flex the spine so as to decrease the pull on the recti muscles. Such cases may be treated intermittently for months or even years for gastritis or indigestion without obtaining the slightest benefit. When the true condition is diagnosed and appropriate treatment instituted, the relief is immediate.

I am, Sir, yours faithfully,

H. F. W. WARDEN.

Detroit, Michigan, U.S A., August 19th.

AUSTRALIA

(FROM OUR OWN CORRESPONDENT)

DEVELOPMENTS OF CANCER CONTROL IN AUSTRALIA DURING 1934

A REVIEW of the attempts at cancer control in Australia during 1934 was presented to the Sixth Australian Cancer Conference held at Canberra, from May 14th–17th, by Dr. M. J. Holmes, senior medical officer, Commonwealth Department of Health, and is now published in the August issue of the *Journal of the Cancer Research Committee.* At present the control of cancer in Australia is limited to organisations in each separate State; the formation of a federal body has been considered but has not been adopted. In New South Wales, during the year, the senate of the University of Sydney relinquished control of the Commonwealth radium, which was distributed to a number of hospitals. The university still continues to hold some radium which is used for research purposes and the production of radon. A committee for study and treatment of cancer has been formed in Sydney and new clinics have been established at Royal North Shore and the Prince Henry Hospitals. In Victoria a public meeting was called by the Premier to discuss the promotion of a State organisation for the control of cancer, and although it was decided to form this body and its objects were defined and a scheme drafted, no further progress has been made. The Melbourne and St. Vincent's Hospitals report expansion of their radiotherapeutic departments and the Austin Hospital, which provides the largest and best accommodation for cancer cases in Victoria, has increased its cancer accommodation from 83 to 130 beds. A clinic for the treatment of cancer of the cervix uteri and of the breast has been opened at the Prince Henry Hospital, Melbourne. In Tasmania two committees, one in the North and one in the South, are now functioning as units of the Tasmanian Anti-Cancer Campaign, the latter committee having been formed during 1934. It is proposed to instal a deep ray therapy plant at the Launceston Hospital. In Western Australia, the principal development has been the establishment of a radon laboratory at the University of Western Australia. In other States no changes are reported. During the year the Commonwealth Radon Laboratory issued 23,210 millicuries of which all, except 1250 units issued for research purposes, was used for treatment, 92 per cent. being issued mounted in needles.

TREATMENT OF INFANTILE PARALYSIS

Many of the differences between those interested in the trial of the method of treating infantile paralysis devised by Sister Kenny have now been satisfactorily composed.[1] At present Sister Kenny is in personal charge of three centres, one at Townsville, one at Brisbane, and one about to be opened at the Royal North Shore Hospital, Sydney. It is believed that a clinic may be opened at the Children's Hospital, Frankston, Victoria, but no definite announcement to this effect has yet been made. The work done at the Sydney clinic is being watched by two committees, one appointed by the Commonwealth and one by the State Government. These committees are to examine cases before and after treatment and to report on the method and its value. In the *Australian Hospital* for June, 1935, there appeared a letter from Dr. James V. Guinane to the chairman of the Hospitals Commission, Sydney, which contained the first detailed account of the method to be published. Dr. Guinane, who has spent many months observing the method, considers that the régime introduced by Sister Kenny is a definite step forward in the treatment of infantile paralysis. He states that: (1) no splints, plaster, or other methods of immobilisation are used; (2) all the joints of the body are moved through their full range, at least once daily; (3) the patient is encouraged to perform movement under the guidance of and with the assistance of the attendant's hands when a movement cannot be performed unaided; as the performance of a movement gains in strength it is resisted so that the recovering muscle is subjected to gradually increasing load; (4) no exercises beyond those prescribed are allowed. The advantages of the absence of splintage are held to be avoidance of (1) stiffness in the joints or disuse atrophy of the muscles, (2) interference with the blood-supply to the parts, (3) any feeling of helplessness or hopelessness engendered in the patient by immobilisation of a limb. The use of active rather than passive movements gives the patient confidence and the movement itself increases the blood-supply. The conclusions reached by Dr. Guinane seem to be that the method is suitable only for cases of infantile paralysis and spastic paralysis and that, as might be expected, the best results are achieved in the earliest cases. Improvement is in his view quicker and greater than when the orthodox methods of treatment current in Australia are used even if cases are not seen very early, but the treatment is of no value in really advanced cases. These claims are much more modest than those originally made for this method. The aspect of the whole matter which continues to puzzle medical men is why it is shrouded in so much mystery and why even Dr. Guinane seems to think that the method must gain recognition before the details are made known. It is understood, however, that a book written by Sister Kenny is at present being printed in Brisbane, and it is to be hoped that it will provide a full account of her method.

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[1] See THE LANCET, 1935, i., 1408.

PANEL AND CONTRACT PRACTICE

What is Manual Labour?

IT might have been thought that after 22 years there would have been little doubt as to what classes of persons were insurable and what classes were not. We learn, however, from the sixteenth annual report of the Ministry of Health that for the first time for many years a question was submitted for decision directly to the High Court under Section 89 (1) of the Act of 1924. The question referred was whether the employment of a professional footballer is to be regarded as employment by way of manual labour. It will be remembered that the income limit of £250 a year applies only to non-manual workers; for manual workers there is no income limit. It has long been held that professional footballers and cricketers were manually employed, this view being based on certain pronouncements of the Court of Appeal in a case arising out of the Workmen's Compensation Act, but certain observations that fell from a judge in the course of an appeal concerning the employment of an acrobat made it apparent that the question whether a professional footballer is, in fact, employed "by way of manual labour" was one upon which it was expedient to obtain the specific guidance of the High Court. The decision was that the employment was not "by way of manual labour" and that the player, therefore, since the rate of his remuneration exceeded £250 a year, was not required to be compulsorily insured.

Regional Medical Service

The paragraphs in the report on the regional medical scheme are of more than passing interest. The total number of references for advice as to incapacity for work in 1934 was 468,476, of which only 2304 were referred by insurance doctors, the remainder coming from approved societies. Of these references 181,220, or 39 per cent., related to men and 287,256, or 61 per cent., to women. The number of persons actually examined on incapacity references was 246,088. The number who were reported to have received a final certificate before the date fixed for examination was 134,678, and 86,628 others did not attend for examination. Of the persons examined 179,010 were reported as incapable and 67,078 as not incapable of work. Consultation references numbered 1361, 70 only of them being from insurance doctors. These figures speak for themselves. They tell us just what it is that keeps the regional medical staff busy all day and every day. And occasionally the onlooker will be constrained to ask: Is it inevitable? or Is it worth while?

Doctors and Chemists

In 1934 there were 15,500 doctors in insurance practice, and medicine and appliances were available as part of medical benefit at about 10,000 chemists' shops to approximately 14,973,000 insured persons entitled to medical benefit. The cost of medical benefit was £8,514,000, of which sum insurance doctors received over £6,175,000 and £1,861,160 of the balance was paid to insurance chemists for the supply of drugs and appliances. The remainder was expended as to £204,000 to insurance doctors in rural areas on account of mileage ; as to £194,000 to doctors for medicine and appliances supplied by them personally or for medicines dispensed by them in country districts where patients are out of reach of chemists ; as to £64,200 on account of insured persons who exercised their option to claim medical benefit through approved institutions ; something over £8000 was set aside to enable country doctors to attend courses of post-graduate study and to provide them with other desirable facilities such as telephones, motor-cars, branch surgeries, or reasonable vacations ; while £7550 was paid on account of insured persons who were required or allowed to make their own arrangements for medical benefit. Of the sum of £8000 referred to above, £2354 was expended in grants which enabled 86 doctors to attend short courses of post-graduate study, but this facility is restricted to insurance doctors in sparsely populated rural districts.

There was a decrease of 2·3 per cent. in the number of insurance prescriptions dispensed in 1934 compared with the previous year, the numbers falling from 59,338,504 to 57,986,980, and the average number of prescriptions issued per insured person entitled to supplies decreased from 4·56 to 4·49. The decline in the number of prescriptions dispensed was less than might have been expected in a year of freedom from severe influenza, and the report states that the continuance of this high frequency is a matter of concern to the department. The total of the chemists' accounts fell from £1,985,885 to £1,941,874. The average ingredient cost per prescription rose from 3·643 pence to 3·677 pence, but the average total cost of drugs and prescribed appliances for insured persons entitled to obtain them from chemists fell from 2*s.* 11½*d.* to 2*s.* 11*d.*

Prescribing Excessive?

The number of cases in which it has been found necessary to withhold money from doctors on account of excessive prescribing continues to be low as compared with the number of cases in which prescribing has been reviewed or has been investigated under the more formal manner prescribed under the regulations. Regional medical officers paid 928 visits to insurance doctors in England where the doctors' prescribing appeared to call for explanation, and in only a small number of cases did this exchange of view fail to enable the Minister either to accept the explanation offered by the doctors, or to satisfy himself that relatively minor departures from a reasonable standard of prescribing would not recur. In ten cases the Minister found it sufficient to inform the doctors that, while it appeared to him that notwithstanding their explanation there was a prima-facie case for referring the matter to the panel committee, he would refrain from that course because he was satisfied of their intention not to give occasion for such reference to be considered in the future. In four cases the Minister felt it necessary, after considering the explanations given by the doctors, to refer to panel committees the question whether the doctors' prescribing had imposed charges on the available funds in excess of what was reasonably necessary. In all four cases the panel committees found that an excess cost had been so imposed during the quarterly periods which were the subject of investigation. The estimated amounts of excess cost ranged from £12 10*s.* to £30. None of these findings was made the subject of appeal. After considering the recommendation of the insurance committees made in the light of the findings of the panel committees, and giving the doctors concerned an opportunity of making oral or written representations, the Minister withheld money during the year from the remuneration of doctors in three cases, the sums withheld being £10, £7, and £3 respectively.

PUBLIC HEALTH

Another Case of Botulism

Dr. Edwin Smith, the Hammersmith coroner, held on Monday an adjourned inquest on the body of a commercial traveller, aged 55, and the jury returned a verdict of "Death by misadventure due to the toxic poisoning of botulism." The dead man's wife testified that on Wednesday, August 14th, she made for her husband a meat pie, of which a little was still left over on the following Sunday, the intervening period having been very hot. She thought, but was not sure, that he did eat some of the stale pie on the Sunday. After a period of three or four days, during the early part of which the patient vomited, and the bowels remained obstinately closed, he was admitted to Hammersmith Hospital. He was then conscious but in some distress, with complete ophthalmoplegia, marked weakness of the muscles of the tongue and throat, and extreme dryness of mucous membranes. Temperature and pulse were normal, and he could speak, although indistinctly. Botulinus antitoxin was given intravenously about three hours later. Death occurred seven hours after admission, apparently from combined failure of respiration and circulation. Dr. A. A. Miles, reader in bacteriology at the British Postgraduate Medical School, in his evidence said he had examined the gravy submitted to him. Cultures from it had yielded filtrates toxic to mice, the toxicity being neutralised by botulinus antitoxin. Search is still being made for the infecting organism. Sir Bernard Spilsbury said he thought that botulism was clearly established as the cause of death. Vegetables are, he remarked, likely to be contaminated if they have been insufficiently cooked and then left in very hot weather. The case is of particular interest as being the only one so far established in this country in which fatal botulism has resulted from food cooked in the home. How under these circumstances it came about that the organism which only develops its fatal toxin under anaerobic conditions was able to do so remains for further investigation.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 31ST, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0 ; scarlet fever, 1781 ; diphtheria, 913 ; enteric fever, 81 ; acute pneumonia (primary or influenzal), 384 ; puerperal fever, 34 ; puerperal pyrexia, 95 ; cerebro-spinal fever, 14 ; acute poliomyelitis, 34 ; acute polio-encephalitis, 2 ; encephalitis lethargica, 6 ; dysentery, 11 ; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 6th was 2585, which included: Scarlet fever, 761; diphtheria, 910; measles, 39; whooping-cough, 404; puerperal fever, 29 mothers (plus 12 babies); encephalitis lethargica, 270; poliomyelitis, 13. At St. Margaret's Hospital there were 25 babies (plus 12 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 3 (0) from measles, 3 (0) from scarlet fever, 21 (4) from whooping-cough, 27 (3) from diphtheria, 60 (13) from diarrhœa and enteritis under two years, and 12 (3) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa and enteritis were scattered over 30 great towns, the highest numbers being Liverpool 9, Southampton, Leeds, and Nottingham each 3, no other great town more than 2. The 3 fatal cases of measles were at Liverpool. Birmingham reported 4 deaths from whooping-cough; the remaining fatal cases were scattered singly over the country. No great town reported more than 2 deaths from diphtheria.

The number of stillbirths notified during the week was 290 (corresponding to a rate of 44 per 1000 total births), including 35 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. T. Madill to *Orion* as Squadron M.O., and W. E. Heath to *Victory* for R.N.B.

Surg. Lt.-Comdrs. A. L. McDonnell, S. G. Weldon, and W. G. C. Fitzpatrick to rank of Surg. Comdrs.

Surg. Lt.-Comdrs. E. J. Mockler to *Pembroke* for R.N. Hosp., Chatham, and T. L. J. Barry to *Londonderry*.

Surg. Lt.-Comdrs. (D.) T. G. A'C. Emberson to *St. Vincent*, P. S. Turner to *Ganges*, and L. V. Donegan to *Pembroke* for R.N.B.

Surg. Lt. W. M. Greer promoted to Surg. Lt.-Comdr.

Surg. Lts. H. L. Cleave and C. N. H. Joynt to *Drake* for R.N.B., H. J. Bennett to *Pembroke* for R.N.B., and R. H. A. Turner to *Queen Elizabeth* and to *Resolution* (on transfer of flag).

ROYAL AUSTRALIAN NAVAL RESERVE

The King has approved of the award of the Volunteer Officers' Decoration to Surgeon Commander Percy Gerald Shelton, M.B., B.S.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. H. P. Widdup to *Pembroke* for R.N. Hosp., Chatham.

Surg. Lt.-Comdr. J. E. Purves's resignation accepted.

Surg. Lt. D. Q. Bawtree promoted to Surg. Lt.-Comdr.

Surg. Lt. E. R. G. Passe to be Surg. Lt.-Comdr.

Surg. Sub-Lt. K. E. O. Ringdahl to be Surg. Lt.

Proby. Surg. Lt. J. L. Dunlop to be Surg. Lt.

Proby. Surg. Lt. E. J. S. Woolley to *Pembroke* for R.N.B.

Proby. Surg. Sub-Lt. R. E. King to *Pembroke* for R.N. Hosp., Chatham.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. W. A. Spong retires on ret. pay.

Maj. and Bt. Lt.-Col. J. G. Gill, D.S.O., O.B.E., M.C., to be Lt.-Col.

Short Serv. Commissions.—The undermentioned Lts. (on prob.) are confirmed in their rank: A. MacLennan, I. U. Young, J. O'Connell, E. J. Pryn, R. Phillipson, P. L. E. Wood, L. E. Odlum, J. G. M. A. Brunet, R. O. A. Leroux, B. d'E. Barclay, N. I. McLeod, G. S. Musgrove, P. R. Wheatley, A. C. Cox, J. J. Groome, J. S. Kelleher, C. Ryan, J. McN. Lockie, W. B. Hamilton, D. S. Cochran, T. P. O'Brien, N. A. Flaherty, and J. P. Weir.

ARMY DENTAL CORPS

Bernard Edward ffrench is granted a temp. commn. in the rank of Lt.

TERRITORIAL ARMY

Col. W. A. Thompson, T.D., retires on completion of tenure as A.D.M.S., 50th (Northumbrian) Div., and retains his rank.

Lt.-Col. and Bt. Col. R. Errington, M.C., M.D., to be Col. and A.D.M.S., 50th (Northumbrian) Div.

Capt. A. O. Bekenn to be Maj.

Capt. D. G. Robinson resigns his commn.

ROYAL AIR FORCE

Flying Offr. H. L. Willcox to No. 6 Flying Training School, Netheravon.

INDIAN MEDICAL SERVICE

Maj. R. A. Warters to be Lt.-Col.

Lt. (on prob.) G. P. Charlewood to be Capt. (on prob.).

The undermentioned officers retire: Col. A. H. Proctor, D.S.O., and Lt.-Col. K. G. Gharpurey.

The undermentioned appt. has been made in India: *D.A.D.M.S.*—Maj. P. F. A. Grant, O.B.E., I.M.S.

The Commander-in-Chief has approved the following appointments in India: Col. W. T. McCowen as Assistant Director of Medical Services, Baluchistan District, and Lt.-Col. S. G. S. Haughton, O.B.E., to act for him while on leave.

COLONIAL MEDICAL SERVICE

A. D. Williamson, M.B., Ch.B., F.R.C.S., has been appointed Ophthalmic Surgeon and Physician, College of Medicine, Singapore, Straits Settlements; and Dr. D. R. Griffith (Medical Officer, Achimota College) becomes Medical Officer, Gold Coast.

Births, Marriages, and Deaths

BIRTHS

CASHELL.—On Sept. 6th, at Reading, the wife of Willoughby Cashell, M.B. Lond., of a son.

EDMONDSON.—On Sept. 1st, the wife of E. L. Edmondson, M.R.C.S. Eng., Leamington Spa, of a daughter.

HUTCHINSON.—On Sept. 4th, at Haywards Heath, Sussex, the wife of H. Procter Hutchinson, M.B. Camb., of a son.

RIDDELL.—On Sept. 5th, at Baldock, Herts, the wife of D. Renton Riddell, M.B. Leeds, of a son.

VALENTINE.—On Sept. 3rd, at Green-street, W., to Lady Freda, wife of F. C. O. Valentine, M.R.C.P. Lond.—a son.

WILCOX.—On Sept. 1st, at King's Lynn, the wife of S. Murray Wilcox, M.R.C.S. Eng., of a son.

MARRIAGES

BARRETT—WRIGHT.—On Sept. 3rd, at St. John the Divine Church, Leicester, John Oridlan Barrett, V.C., F.R.C.S. Eng., to Ernestine Helen, only child of Mr. Ernest Wright of Birstall, Leicestershire.

HUGHES—SMITH.—On Sept. 5th, at the Catholic Cathedral, Shrewsbury, William Stanley Hughes, M.B. Lond., to Elizabeth Patricia Smith, widow of Walter R. H. Smith, M.D., of Bicton Heath.

PEARCE—WALLACE.—On Sept. 7th, 1935, at Chelsea, James G. Pearce, M.Sc., M.I.E.E., F.Inst.P., to May Isabel Wallace, M.B., Ch.B. Birm., D.P.M.

TAYLOR—ROBINSON.—On Sept. 7th, at St. Peter's Church, Ealing, Wallace Antony Frederic Taylor, M.R.C.S. Eng., to Beryl, daughter of Major R. A. Robinson of Ealing.

TERRY—HALSTEAD.—On August 31st, at Mill Hill Chapel, Leeds, James Oliver Terry, M.B. Leeds, M.R.C.P., to Dorothy Halstead, M.Sc., M.B. Leeds, eldest daughter of Mr. and Mrs. T. Halstead of Rodley.

DEATHS

DORGAN.—On Sept. 1st, at Flagstaffe House Convalescent Hospital, Southport, James Dorgan, M.B. R.U.I., D.P.H., Lt.-Col. R.A.M.C., retd., superintendent of the hospital.

HAMILTON.—On Sept. 1st, at Southampton, Herman Lauder Hamilton, M.B. Aberd., D.P.H., in his 60th year.

ROSE.—On Sept. 1st, at Aberdeen, George Rose, M.B. Aberd., D.P.H., aged 80.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOVEY TRACEY HOSPITAL.—Miss Violet Wills has laid the foundation-stone of a children's jubilee ward at this hospital.

MEDICAL NEWS

University of Cambridge

Dr. J. A. Ryle has been appointed regius professor of physic in the university in succession to Sir Walter Langdon-Brown.

John Alfred Ryle, the son of Dr. R. J. Ryle of Brighton, was born in 1889 and educated at Brighton College and Guy's Hospital medical school. He graduated M.B. Lond. in 1913, being awarded the gold medal of the university. When war broke out he was released from his third resident appointment at Guy's to join the R.A.M.C. (S.R.) and served as a captain in France and Belgium from 1914 to 1918. He returned to Guy's in 1919 as medical registrar, and in the same year took his M.D., receiving another gold medal. He acted as assistant in the children's department and Astley Cooper assistant to the curator of the Gordon Museum until 1920, when he was appointed assistant physician to the hospital and demonstrator in morbid anatomy and medical pathology. Dr. Ryle was elected a fellow of the Royal College of Physicians of London in 1924, and the following year was chosen to deliver the Goulstonian lectures on Gastric Function in Health and Disease, published in our columns and later in book form; and in 1932 gave a Hunterian lecture on the Natural History of Duodenal Ulcer to the Royal College of Surgeons of England. In 1929 he became physician to Guy's, and in 1932 he was appointed physician to His Majesty's Household. Dr. Ryle's contributions to medical literature have covered a wide range, including philosophical reviews as well as original contributions to medical science, notably in connexion with diseases of the intestinal tract and the cardiovascular system.

British Congress of Obstetrics and Gynæcology

The 1936 meeting of the British Congress of Obstetricians and Gynæcologists will be held in Belfast from April 1st to 3rd under the presidency of Prof. R. J. Johnstone. The subject for discussion will be conservative treatment, by operation or otherwise, of pathological conditions of the ovaries, tubes, and uterus, with special reference to functional results. Mr. C. H. G. Macafee, 18, University-square, Belfast, is the local scientific secretary.

Central London Throat, Nose, and Ear Hospital

A course in methods of examination and diagnosis will be held at this hospital from Sept. 30th to Oct. 4th at 4.30 daily. A course in anatomy and physiology for Part I. of the D.L.O. examination will be given by Dr. Archibald Durward from Oct. 7th to Oct. 19th, while a clinical course for Part II. has been arranged to take place from Oct. 21st to Nov. 2nd.

The annual address of the hospital will be given at 4 P.M. on Friday, Oct. 11th, by Mr. A. Brown Kelly, consulting surgeon for diseases of throat and nose at the Victoria Infirmary, Glasgow. He will speak on the œsophagus in young children. The usual Friday lectures, to which medical visitors are invited, will be held throughout the winter and will be announced in our Weekly Diary.

King's College Hospital

Lectures and demonstrations, open to all medical practitioners, will be held at this hospital on Saturday, Oct. 5th, from 11 A.M. to 6 P.M., and on Sunday morning, Oct. 6th, before the beginning of the new session. The annual dinner of past and present students will take place at 8 P.M. on Oct. 5th at the Mayfair Hotel, London, W., with Sir Charlton Briscoe in the chair. The inaugural lecture will be given at 4.30 P.M. on Thursday, Oct. 10th, by Dr. G. F. Still. From Oct. 3rd to Dec. 12th a post-graduate course of lectures on tuberculosis will be given at the medical school on Thursdays at 9 P.M., to which practitioners are also invited.

Welsh National School of Medicine, Cardiff

On Sept. 4th the Merioneth county council received a deputation asking that the rate-aided contributions to the school from the county should be resumed. Dr. Joyce, pro-chancellor of the University of Wales, spoke of the importance of medical services and said that a united Wales should stand behind a national institution. Mr. Jenkin James, secretary of the school, said that if Merionethshire decided to resume contributions it was probable that Newport borough and Radnor county council would fall into line, and this would mean an increase of £400 in the income of the school. After discussion the council unanimously agreed to resume payments.

A PORTRAIT of Sir Robert Jones, intended to commemorate his work and that of Hugh Owen Thomas, was unveiled by Dame Agnes Hunt on Sept. 4th at the Ceiriog Memorial Institute at Glyn Ceiriog.

THE meeting of the Continental Anglo-American Medical Society arranged for Oct. 5th in Paris has been postponed indefinitely.

University of Liverpool

Dr. H. H. Stones has been appointed Louis Cohen professor of dental surgery and director of dental education at the university in succession to Prof. W. H. Gilmour, who has retired. Dr. Stones is honorary dental surgeon to University College Hospital dental school, and has been in practice in London and St. Leonards.

Middlesex Hospital Medical School

The annual refresher course for former students of this school will begin on Saturday, Sept. 28th, at 2.15 P.M., and continue up to the evening of Oct. 1st. The annual dinner for past and present students and their friends will be held on Tuesday, Oct. 1st. at the Savoy Hotel, at 7 for 7.30 P.M. Dr. H. Campbell Thomson will take the chair.

London Hospital

Sir William Goschen, chairman of this hospital, spoke at a meeting of the court of governors of his own experience, as a patient, of the efficiency of the administration of the hospital. He detailed the scheme to erect a block for paying patients so that persons of moderate means might have the benefits of the skilled treatment that the hospital could offer.

Hull Contributory Scheme

In the five years this scheme has existed over £100,000 has been given to the hospitals taking part. The present membership totals 67,000, and this is by no means regarded as saturation point, especially in the rural districts.

Donation to Radcliffe Infirmary, Oxford

Lord Nuffield has given £8000 to this hospital for the construction of a new medical ward and accommodation for its nursing staff.

Stratton Cottage Hospital

The wards in this hospital, said to be the second oldest cottage hospital in the country, had become out of date and the Bishop of Truro recently opened a large modern ward and two private wards there.

Child Guidance in Sheffield

An address was given by Dr. William Moodie, medical director of the London Child Guidance Clinic, at a meeting held recently at the University of Sheffield, to consider what could be done to provide a child guidance clinic for the city. A committee was appointed to consider the question, which included the following medical members: Dr. Thomas Chetwood, Prof. A. E. Naish, Dr. Helen Wilson, Dr. E. Fretson Skinner, Dr. Arthur Pool, Dr. F. E. E. Schneider, Dr. A. G. Yates, and Dr. Annie Greenep.

Institute of Medical Psychology

Five seminars on fundamental psychological conceptions will be given by Prof. C. G. Jung of Zurich from Sept. 30th to Oct. 4th at 7.45 P.M. at the institute. The meetings will be open to medical graduates and to professors, readers, and lecturers of the University of London. Application for tickets should be made in advance to the educational secretary of the institute, Malet-place, London, W.1.

Other courses to be held during the year include a five weeks' introductory course on psychotherapeutic theory and method which will be given on Monday and Thursday afternoons from Oct. 7th to Nov. 7th; a post-graduate course on this subject will also start on Oct. 7th, and during the session will cover the work required for the D.P.M. On Tuesdays, from Oct. 22nd to Dec. 10th, at 6 P.M., Dr. Emanuel Miller will lecture on problems of parenthood.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 16th, to SATURDAY, Sept. 21st.—WESTMINSTER HOSPITAL. All-day post-graduate course in medicine and surgery. (Men only.)

Appointments

KERSHAW, J. D., M.B. Lond., D.P.H., has been appointed Medical Officer of Health for Accrington.

PATTERSON, W. G., M.D. Edin., M.R.C.P. Lond., D.P.H., Medical Officer of Health for Barnsley.

West End Hospital for Nervous Diseases.—The following appointments have been made:—

GOITEIN, P. L., M.B. Lond., D.P.M., Hon. Medical Psychologist to the Child Guidance Unit.

LLOYD, J. E. SETON, M.B. Liverp., D.P.M., Hon. Clinical Psychologist to the Out-patient Department.

LUCAS, R. E., M.B. Brist., Hon. Medical Psychologist to the Child Guidance Unit.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Hospital for Sick Children.—Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.
Aberdeen Royal Infirmary.—Hon. Jun. Asst. Surgeon to Ear, Nose, and Throat Dept.
Abyssinia Ambulance Unit.—Volunteers.
Altrincham General Hospital.—Sen. and Jun. H.S.'s. £150 and £120 respectively.
Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. At rate of £150.
Bath and Wessex Children's Orthopædic Hospital, Combe Park.—H.S. At rate of £120.
Bath Royal United Hospital.—H.S. At rate of £150.
Birmingham and Midland Eye Hospital.—H.S. At rate of £130.
Birmingham, Dudley-road Hospital.—Jun. M.O. At rate of £200.
Bolton Royal Infirmary.—H.S. £125.
Bradford Children's Hospital.—H.S. £100.
Bradford City.—Asst. School M.O. £500.
Bradford Royal Eye and Ear Hospital.—Jun. H.S. £160.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.
Bristol, Southmead Municipal Hospital.—Asst. Res. M.O. £250.
British Empire Cancer Campaign, 12, Grosvenor-crescent, S.W.—Assts. for Cancer Research Laboratory. Each £350 to £400.
Cancer Hospital, Fulham-road, S.W.—Asst. Radiologist. £350.
Chester County Mental Hospital.—Jun. Asst. M.O. £350.
Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall.—H.P. At rate of £150.
Coventry and Warwickshire Hospital.—Res. H.S. Also Cas. O. Each £125.
Derbyshire County Council.—Tuberculosis Officer. £750.
Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose and Throat Depts. £175.
Doncaster Royal Infirmary and Dispensary.—Sen. Res. £250. Also Res. Anæsthetist. At rate of £175.
Dreadnought Hospital, Greenwich, S.E.—Med. Supt. £250
—Asst. Welfare M.O. £500.
M.O.H. £600.
Memorial Hospital.—Res. H.S. £150.
an-street, E.—Gynæcologist.
ospital, Shrewsbury-road, E.—H.S. to
s. O. At rate of £120.
Edinburgh Royal Infirmary.—Clin. Asst. for Ear, Nose, and Throat Dept. £105.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Surg. Reg. £100.
Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.
Fareham, Hants, Knowle Mental Hospital.—Jun. Asst. M.O. £350.
Gloucestershire Royal Infirmary.—H.P. At rate of £150.
Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. At rate of £200.
Guildford, Royal Surrey County Hospital.—Res. Surg. O. £250. Also H.P. and Cas. O. £150.
Halifax Royal Infirmary.—Res. Surg. O. At rate of £250.
Hospital for Sick Children, Great Ormond-street, W.C.—Research Fellow for Morbid Anatomy. £500. Res. Med. Supt. £300. Asst. M.O. £300. Also Out-patient Med. Reg. £250.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.
Hove General Hospital.—Res. M.O. At rate of £150.
Huddersfield Royal Infirmary.—H.S., H.P., and Res. Anæsthetist. Each at rate of £150.
Huddersfield, St. Luke's Hospital.—Res. M.O. £200.
Ilford, West Ham Mental Hospital, Goodmayes.—Jun. Asst. M.O. £350.
King's College Hospital, S.E.—Registrar to Ear, Nose, and Throat Dept.
Leicester Royal Infirmary.—Jun. Res. Anæsthetist. At rate of £150. Also Sen. Cas. O. £125.
Leicestershire County Council.—Asst. County M.O.H. £700.
Liverpool County Borough.—Two Jun. Asst. School M.O.'s. Each £500.
Liverpool, County Mental Hospital, Rainhill.—First Asst. M.O. £700. Second Asst. M.O. £650.
Liverpool Royal Babies' Hospital, Woolton.—Res. M.O. At rate of £90.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.
Maidstone, West Kent General Hospital.—Two H.S.'s. Also H.P. Each £150.
Manchester, Ancoats Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £100.
Manchester, Booth Hall Hospital.—Jun. Asst. M.O. At rate of £200.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. for Ear, Nose, and Throat Dept. £200.
Mansfield, Harlow Wood Orthopædic Hospital.—Two H.S.'s. Each at rate of £200.
Margate and District General Hospital.—Res. M.O. £150.
Middlesbrough Education Committee.—Sen. Asst. School M.O. £500.
Middlesbrough, North Ormesby Hospital.—Hon. Orthopædic Surgeon.
Middlesbrough, North Riding Infirmary.—Third H.S. £125.
New Zealand, University of Otago and Dunedin Hospital.—Sen. Res. M.O. £500.
Northampton General Hospital.—Hon. Obstet. Surgeon. At rate of £150.
North Riding of Yorkshire County Council, &c.—Two M.O.H.'s. Each £800.
Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.
Norwich, Norfolk and Norwich Hospital.—H.P. £120.
Nottingham General Dispensary, Gregory Boulevard Branch.—Res. Surgeon. £250.
Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. Also Cas. O. Each at rate of £150.
Plymouth Education Committee.—Asst. School M.O. £500.
Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P. At rate of £125.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.
Reading, Royal Berkshire Hospital.—Res. H.P., Res. Cas. O., also Res. M.O. for Blagrave Branch Hospital. Each at rate of £125.
Richmond Royal Hospital.—Jun. H.S. At rate of £100.
Rotherham Hospital.—Cas. H.S. £150.
Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res. Officer. £150.
St. Mary's Hospital, W.—Surg. Reg. £200. Also Obstet. Reg. and Jun. Clin. Asst. for X Ray Dept. Each £50.
St. Thomas's Hospital, S.E.—Surgeon. Also Surgeon to Out-patients.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.
Sheffield, Jessop Hospital for Women.—Two H.S.'s. Each at rate of £100.
Sheffield Royal Infirmary.—Clin. Asst. for Dermatological Dept. £300.
Sidcup, Queen Mary's Hospital.—Asst. M.O. £350.
Southampton.—Part-time Antenatal M.O., Gyn. and Con Obstet. At rate of £300.
Southend-on-Sea General Hospital.—H.S. At rate of £100.
Stamford, Rutland and General Infirmary.—H.S. At rate of £250.
Swanley, Kent, Alexandra Hospital for Children.—Res. Asst. M.O. At rate of £200.
Swansea General and Eye Hospital.—H.P. Also Temp. H.S. Each at rate of £150.
University College Hospital, Gower-street, W.C.—Tuberculosis Officer. £300.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Surgeon.
Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S. At rate of £150.
Willesden General Hospital, Harlesden-road, N.W.—Res. Officer. At rate of £100. Also Asst. Surg. O. £50.
Wokingham, Berks, Pinewood Sanatorium.—Asst. M.O. £550.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Dingwall (Ross) and Stapleford (Nottingham).

SWINDON VICTORIA HOSPITAL.—More beds are needed at this hospital, while there has been a large increase in the out-patients' department. An average of four beds has been occupied by road accidents, with an average stay of 15·8 days. The outlay for these cases has been considerable, and the full cost of treatment has rarely been recovered. There was an excess of income over expenditure of £13 owing to some substantial legacies and the contributory receipts were over £5000.

NOTES, COMMENTS, AND ABSTRACTS

OTO-RHINO-LARYNGOLOGICAL CLINICS IN BOSTON AND PHILADELPHIA

By Maxwell Ellis, M.D. Lond., F.R.C.S. Eng.
SENIOR REGISTRAR, GOLDEN SQUARE THROAT HOSPITAL

During my tenure of the Geoffrey E. Duveen Travelling Studentship I worked at the Massachusetts Eye and Ear Infirmary, Boston, from Feb. 1st to May 1st, 1934, and at the Chevalier Jackson Bronchoscopic Clinic, Philadelphia, for eight months in 1933 and 1934. I have set out below a brief account of these clinics for the benefit of those who have not had the privilege of visiting them.

The Massachusetts Eye and Ear Infirmary, Boston

In 1824 two Boston doctors started a free clinic for the treatment of diseases of the eye. This occupied only a single room, but was so successful that a fund was started and the money was raised to found the Boston Eye Infirmary in 1826. This grew rapidly, and in 1827 moved to larger quarters and was formally incorporated as the Massachusetts Charitable Eye and Ear Infirmary. The hospital continued to expand and was moved several times, until it arrived, in 1899, at its present site overlooking the Charles River. For many years the eye department was the more important one, but in 1922 the laryngological department of the Massachusetts General Hospital became an integral part of the infirmary, closely related with the ear department, and in 1925 the aural and laryngological surgeons appear in one group as "oto-laryngologists." In 1924 the name of the infirmary was changed by the omission of the word "charitable."

The building.—To-day the infirmary contains 250 beds, equally divided between the ophthalmologists and oto-laryngologists. The basement of the building is occupied by the kitchens, dining-rooms (for the nurses and house-officers), furnaces, and other domestic offices.

The ground floor contains a large laboratory, where the routine pathology and the research work connected with the oto-laryngology department is conducted. It can also be used as a lecture-room, and is equipped with projection cameras for lantern and microscope slides, moving pictures, and a special one for projecting X ray negatives, as well as an orthodiagraph. This laboratory was designed by Dr. H. P. Mosher, the chief of the staff, to fulfil these several functions, and has been furnished largely at his own expense, to include every device for photography and microphotography. The X ray department, the laboratory (with a specially endowed library) belonging to the ophthalmology department, and the various business offices occupy the remainder of the floor. The X ray department is well equipped, and has a large room for fluoroscopy, much used in the treatment of patients with œsophageal disease, and also in the endoscopic removal of certain radio-opaque foreign bodies.

The first floor consists of the male wards and the four operating theatres, equally divided between the two departments. The out-patient department, a very spacious and well-equipped one, is also on this level, in a special building devoted otherwise to the out-patient departments of the adjoining Massachusetts General Hospital. These three buildings, the two hospitals and the out-patient block between them, communicate with each other on every floor.

The third floor contains the female and children's wards, again equally divided; and the top floor consists entirely of single rooms for private patients, and an operating theatre, where all operations on private patients are performed.

There is a separate building adjacent to the infirmary, the lower half of which contains isolation wards for very septic cases or suspected cases of infectious fevers. The house-officers' quarters are in the upper half.

Private patients.—Connected by underground passages with the two hospitals already mentioned are two others for private patients, the Phillips' House, which is very luxurious, and the Baker Memorial Hospital, for persons of moderate means. All members of the staff have the privilege of sending their private patients to these hospitals.

Association with general hospital.—Thus, although the Massachusetts Eye and Ear Infirmary is an independent organisation as far as finance and policy are concerned, it is closely associated with the Massachusetts General Hospital (which can be regarded as the parent institution of the group) to the benefit of both. This association takes practical shape in the joint filing and keeping of records, and in the formation of various clinics, such as the tumour, allergy, and thoracic clinics, presided over by members of both hospitals. The nursing staff of the infirmary is supplied from the main hospital.

Charges made to patients.—Adult out-patients are charged seventy-five cents for the first visit and fifty cents for each subsequent visit. For children under 16 years of age, these figures are, respectively, fifty and twenty-five cents. In-patients pay what they can afford. All investigations, such as X ray and blood counts, are added to the cost borne by the patient, and a very efficient almoner's department takes care of this aspect of affairs. Many patients, however, are treated free.

Staffing.—So far the organisation will have been seen to differ little in essentials from that of our own hospitals. It is in the method of staffing where fundamental differences begin to appear. First of all there is a director of the whole hospital. He is always a doctor, is appointed by the board of trustees, and organises the medical and business administration. His influence is not always openly visible, but it is nevertheless constantly present. The post is now held by Dr. George H. Bigelow. Under him are two main executive officers, Dr. Frederick H. Verhoeff, the chief of ophthalmology, and Dr. Harris P. Mosher, the chief of oto-laryngology and professor of oto-laryngology in the Harvard medical school. Each is a virtual dictator in his own department, but answerable to the director and trustees. These three men are paid salaries, and do not engage in practice outside the infirmary. They have their private consulting-rooms in the infirmary, and are allowed to see a certain number of private patients—a nurse and a stenographer is provided for each of them. Appointments to the staff originate by recommendation from the board of surgeons, but the chiefs of staff and director wield considerable influence in this regard.

The oto-laryngology department is subdivided into otological and laryngological sections. There are three full surgeons to each section, and each takes his turn for four months at a time—this is known as being "on service." Thus each surgeon for eight months of the year has no hospital commitments as far as non-paying patients are concerned. He has an associate and an assistant surgeon, and several clinical assistants attached to his "service." The whole acts as a unit and deals with the out- and in-patient work of the public wards. This is known as the system of "rotating services," and is widely used in the United States. It gives opportunities to more younger men than our own system, and allows the older men with established practices a respite, other than their annual vacation, from hospital work. When not "on service," the staff members are privileged to use the private wards. The various "services" are welded into a homogeneous whole in the way I shall soon describe.

The X ray department is under the charge of an officer (Dr. A. S. Macmillan) who is paid a salary and attends at the infirmary every morning until lunch-time. The out-patient clinics take place, and all operations, except emergencies, are performed in the morning. Nearly every patient is X rayed for sinus, mastoid, or laryngeal disease. Nurses trained to the work take these films. The officer in charge attends regularly in the operating theatres, and with experience becomes skilful at correlating the information thus acquired with the X ray appearances. He personally conducts all the fluoroscopic examinations and gives a full report on each film.

All material removed at operation is sent down to the laboratory, and the sections prepared from it are reported upon by the assistant in the laboratory, in consultation with Dr. Tracy B. Mallory, the chief of the pathological department of the Massachusetts General Hospital. The assistant is not paid a salary, and usually occupies the post as a preliminary to becoming a house-officer.

Finance.—The infirmary depends financially upon its endowments, which are moderate, on fees paid by patients, which form the bulk of the income, and on voluntary contributions, a very variable factor. The patients pay more than they would in similar English institutions; on the other hand, much extra expenditure is involved in the salaries paid to the various members of the staff to ensure their full-time work.

TEACHING METHODS

Undergraduates.—Teaching methods employed by Dr. Mosher in the department of laryngology and otology may be of interest. The students in the Harvard medical school receive a course of lectures on the diseases of the ear, nose, and throat, and are made to practise with the head-mirror on specimens before doing so on patients. Many ingenious preparations have been devised for this purpose. For example, one consists of a head from a cadaver mounted in a wooden frame on which to practise indirect laryngoscopy and anterior rhinoscopy. Another is a half-head sectioned so that the ear drum is the dividing line between the superficial and deep portions. The drum is removed, and a small piece of paper with a printed representation of a drum is used to replace it. Paracentesis can conveniently be practised on such a model. Senior students are allowed to examine patients, and attendance at many demonstrations in the out-patient department is compulsory. As a result the average Harvard medical student has opportunity to acquire considerable technical skill in oto-rhino-laryngological examination. Certain members of each "service" are assigned for teaching in rotation.

The *post-graduate* course in rhinology and laryngology is given by Dr. Mosher. It is founded on two principles: (1) that a sound knowledge of anatomy and pathology is essential, and that this is likely to be lacking in men who have been engaged in practice for any length of time, which men form the bulk of the post-graduate students; (2) that anatomy can best be learnt by dissection, and pathology by the study of morbid specimens and slides. Thus a number of cadaver heads and half heads is issued to each man for dissection. He then draws his specimens (using a drawing-box) and makes plaster casts of certain of them. There can be little doubt that he will remember the anatomical features of a specimen which he has dissected, drawn, and cast in plaster and painted, and in any case he retains the cast as a reminder. It takes very little time to learn to produce an average cast though a really artistic one demands much skill. The whole head and neck, with the brain, is thus dissected, drawn, and modelled. In addition, there are lectures on anatomy, pathology, and neurology, and many slides are issued for study. Each man has to prepare a paper which he reads to the whole class, illustrating it with specimens or lantern slides. Regular viva voce examinations are held weekly. At the conclusion of the six weeks' course, each man has a number of plaster casts which he can take home to serve as a three-dimensional atlas.

Resident appointments.—As has been noted above, a man waiting for resident appointment can sometimes obtain a post as assistant in the laboratory, where he is trained in the technique of section-cutting, microphotography, and in histo-pathology and in methods of research. He also spends some time in the out-patient and X ray departments and learns enough about the technique of preparing plaster casts of dissections to demonstrate to post-graduates. About a year is thus spent in pathology as a preliminary to the 22 months as a resident. During this latter period, the house-officer spends three months in each of the various "services." His first three months are occupied with routine clinical pathology. All in-patients have blood counts performed on admission; the house-officer also examines all specimens of cerebro-spinal fluid, and is responsible for taking a full history of every patient on admission. His experience includes three months with the plastic surgeon (Dr. V. I. Kazanjian).

Consultations and discussions.—Every Wednesday morning at 11.30, a meeting of all members of the staff is held in the laboratory when microscope slides from recent cases are projected and described by the assistant, and any unusual cases of the week are presented by the residents. A free discussion follows. Once a month the meeting is devoted to cases which have proved fatal.

Other meetings are held on Friday evenings in the Harvard medical school, where an article of interest from the current journals is assigned to each house-officer, whose task is to present it in abstract, illustrating it as best he can with the material at hand, or making models and drawings himself. As his paper is open to discussion, he must also have familiarised himself with the bibliography given with the article, and with other work which this may not have included.

On Monday evenings, a selected member of the staff dines with the residents and afterwards gives an informal talk on a previously determined subject.

It will be seen that a young doctor who has spent three years at the Massachusetts Eye and Ear Infirmary will have received an excellent training in anatomy and pathology, will have seen a large amount of clinical work critically handled, will have had considerable operative experience, and will have learned how to present cases and papers before an expert audience.

The Chevalier Jackson Bronchoscopic Clinic, Philadelphia

In 1907 Dr. Chevalier Jackson published his first book on endoscopy, a prelude to a larger and more complete work which appeared in 1915. He built up his first bronchoscopic clinic in Pittsburgh, but came to Philadelphia in 1917 and set up a clinic at the Jefferson Hospital. Later on he developed two more at the Graduate and University hospitals, and in 1930 a third at Temple University Hospital, to which he now devotes his sole attention; over five thousand new cases from all over the world were dealt with at this clinic last year. His enthusiasm and inventive capacity remain unimpaired, and he is still in pursuit of the ideal of an endoscopic clinic with a trained personnel as part of the standard equipment of every large general hospital.

This clinic is situated in the northern part of the city, four miles from the centre. Dr. Jackson insists that all visiting assistants must stay at least three months and must live near the hospital, but this does not apply to members of the fortnight's course which is given twice a year.

Buildings.—The clinic occupies a suite of rooms on the second floor of the Temple University Hospital. These consist of Dr. Jackson's private office, a changing-room, the main office, an examining-room, a scrubbing-up-room, a preparation-room, and the operating theatre, with a stand for spectators. Each of these connected rooms opens also on to the passage.

Anæsthesia.—All patients, except children under 10 years of age, receive local anæsthesia (10 per cent. cocaine) before endoscopy. Out-patients who will be able to leave the hospital shortly after treatment, walk into the examining-room and are anæsthetised there. In-patients are brought up on carriages and wheeled into the preparation-room, where they are given their local anæsthesia.

The *personnel* of the clinic consists of Dr. Chevalier Jackson, the professor of bronchoscopy, his son, Dr. Chevalier L. Jackson, the professor of clinical bronchoscopy, Dr. E. Van Loon, the associate professor of bronchoscopy, and a clinical assistant, Dr. N. M. Levin. These three last-named are on salaries, and, with the exception of Dr. Van Loon, are full-time workers. The medical staff is completed by an unpaid assistant who stays for varying periods, not less than three months. This last post is generally filled for many months ahead.

The nursing staff consists of a head nurse and her assistant, both fully trained in the work, and a "pupil nurse," corresponding to a staff nurse in her last year of training. On operating days, another nurse is sent to the clinic. Each nurse has her own particular work in the team.

The *theatre* contains an operating table of the type designed by Dr. Jackson, a large cabinet draped with sterile sheets containing laryngoscopes, bronchoscopes, and œsophagoscopes, a movable stand for six dry-cell batteries, two electrically driven suction-pumps, and stands and tables for forceps, bougies, aspirators, swab-holders, sterile gowns, gloves, sheets, and head-holding towels; a set of instruments for tracheotomy is provided for emergencies.

Patients by appointment.—The clinic holds no out-patient department. All patients are referred by physicians from the various departments of the hospital or by outside doctors, and are given appointments. The secretaries who take a full history from each patient on arrival are not medically trained, but have acquired great skill in eliciting and setting out case-histories, and rarely omit anything of value.

Routine examination.—An ear, nose, and throat examination is made, and a thorough general examination, by the clinical assistant, the records being typewritten in triplicate. Then follow an X ray examination and a Wassermann reaction test. (All in-patients, by a Pennsylvania State law, have a blood count and an analysis of the urine performed on admission.) Cases of pulmonary disease and of suspicious tuberculous laryngeal disease have the sputum examined, if this has not already been done. Very often another physician is called into consultation, especially with children. No effort is spared to discover everything possible before an endoscopic examination is performed.

Types of cases and treatments.—The operating days are Mondays and Thursdays, and there is an average list of 25 patients. An average list (9/4/1934) of the tentative diagnoses of 27 cases is as follows: laryngeal stenosis, 5 cases; œsophageal stenosis, 5 cases; pulmonary abscess, 4 cases; bronchiectasis, 3 cases; papilloma of larynx, 2 cases; asthma, 2 cases; achalasia of the cardia, 1 case; cancer of the larynx, 1 case; "cough," 1 case; "dysphagia," 1 case; "hoarseness," 1 case.

For these patients the procedures adopted were: œsophagoscopy (7 cases); bronchoscopy (11 cases); direct laryngoscopy (9 cases).

Each doctor has his own patients, but occasionally a certain amount of interchanging takes place. Three doctors at least are essential in order to keep the list going without waiting between cases. One cocainises the patients in the preparation- or examining-room, while another holds the head for the operator.

Other treatments are carried on daily. These consist chiefly of dilatation of œsophageal stenoses by means of pneumatic dilators, retrograde bougies, or Hurst's mercury bougies. A certain number of patients come up for dressings. Each patient is given an appointment, so that, day by day, the work of the clinic follows definite and systematic lines.

Procedures other than endoscopic examinations are usually not undertaken on Mondays or Thursdays. All laryngeal operations except laryngectomies are performed by members of the clinic. Cases for laryngectomy, together with those for excision of a pharyngeal pouch (performed as a one-stage operation), are handed over to the senior surgeon, Dr. Wayne Babcock. In these latter cases, however, the endoscopist assists by passing an œsophagoscope into the pouch during the first part of the operation, and during the actual excision, reintroducing the œsophagoscope into the œsophagus to prevent removal of too much tissue with consequent stenosis. Gastrostomies are performed for the clinic by the general surgeons.

Foreign bodies.—All cases of foreign body, which form a little under 5 per cent. of the work of the clinic, undergo a searching clinical examination, and are then X rayed. The X ray department, under Dr. Edward Chamberlain, assisted by a large full-time staff, is magnificently equipped and renders invaluable information. The kind of foreign body, the length of time it has been present, and whether any previous attempts at removal have been made, are all taken into account in deciding when to operate. Removal in cases of small or peripherally situated radio-opaque pulmonary foreign bodies (and the rare cases of gastric foreign body) is performed under fluoroscopic guidance. To this end Dr. Chamberlain has designed a biplane fluoroscope embodying special features which lightens considerably the task of the endoscopist. It also affords the maximum of protection to the patient and bystanders. This apparatus is housed in a large room opposite the clinic, so that the pumps, batteries, and instrument table can easily be wheeled into it.

Teaching and research.—In the medical school another set of rooms is devoted to teaching and research. It contains four complete sets of instruments, operating tables for work on the cadaver and on dogs, numerous foreign bodies of all descriptions with which to practise, a lantern slide and a moving picture projector with a screen, numerous lantern slides and films, drawing paper, and chalks of a special make which Dr. Jackson uses effectively, and every conceivable device for endoscopic work and teaching. Every new assistant is given instruction here, first on the cadaver, and then on dogs, until his technique is considered sufficiently good for him to be allowed to work in the clinic itself. Dr. Jackson holds strongly that the education of the eye and the hand necessary for endoscopic work is best acquired by continual practice on the cadaver and on animals, and that the patient should not be the victim during the gaining of such skill.

It will be observed from the figures quoted above, of an average day's work, that although Dr. Jackson's interest in endoscopy was at first stimulated by the mechanical problems presented in the removal of foreign bodies from the bronchi and œsophagus, the clinic has long outgrown this limited sphere of usefulness. The clinic links up with nearly every other department of the hospital. Dr. Jackson believes that endoscopy has now reached the point where it should be regarded as one of the routine methods of clinical examination and treatment, and that medical students should be taught to consider it as such. This presupposes that the endoscopist has been thoroughly trained in general medicine and surgery as well as in direct endoscopy. In Philadelphia and also in other large American cities endoscopy is attaining this position in medical education and the supply of well-trained men is adequate.

In addition to cases with pulmonary and bronchial suppuration, many of which are given regularly recurring treatments, all cases of asthma are sent by the asthma clinic for bronchoscopy. It has been found that often an aspiration reduces the frequency the attacks, and that relief has followed the ministration of an autogenous vaccine prepared om the aspirated secretion. Especially in children th pulmonary suppuration of unknown origin, oncoscopy has frequently been of assistance, casionally revealing an unsuspected foreign body, helping, by regular aspirations, in the resolution the suppurative process. The chest physicians e sending more and more of their cases to the nic, as they realise how useful endoscopy may be them. In carcinoma of the bronchus the growth ten originates in the larger bronchi, within endoopic view, and the possibility of early diagnosis these days of rapidly improving technique in oracic surgery may be of great importance.

Patients with dysphagia form the great majority the œsophageal cases. The advantages of conntration of such cases are clear, especially for common diseases such as achalasia of the cardia non-malignant ulcerations or strictures at the ver end of the œsophagus.

The laryngeal cases are divisible into those with enosis, chiefly children, and those with benign owths or malignant disease. Persistent hoarseness is e symptom for which most of the patients are sent the clinic, and, owing to Dr. Jackson's insistence on endoscopy in all such cases, he sees probably higher percentage of cancer cases than any other yngologist in which the prognosis of laryngosure would be favourable. A large number of nign tumours of the cords are removed under rect vision, with complete relief of symptoms.

Gastroscopy is another growing aspect of the nic's activities, the Schindler flexible gastroscope ing used with satisfactory results in collaboration th the gastro-enterology department.

I have attempted to describe only the scope and me of the aims of the clinic, and have not entered o any discussion of the methods of treatment opted in particular diseases. These have all been blished by Dr. Jackson in a series of papers extendg over a period of nearly forty years and are miliar to all laryngologists.

In all the work of the clinic insistence is laid upon instaking preliminary investigation, gentleness of ocedure, and examination by direct vision whereer possible.

MEDICAL AUTHORS IN THE THIRTEENTH CENTURY

THE medical literature of six and seven hundred ars ago contemporary with the paramount activities the church was mainly in the hands of clerical gnatories, and in the current "Annals of Medical story" this is clearly shown by an essay on the edical writers of the thirteenth century in England itten by Dr. J. C. Russell. Medical literature in igland held a high position with such contributors as nong those mentioned by Dr. Russell), Gilbertus iglicus, Richard of Wendover, Roger of Lacock, igh of Evesham, and many others, whose names cur frequently in footnotes to historical articles d who come in here for reference. These writers, arly all of them, held clerical office, at any rate as acons, very usually as prebends or canons, or at ist enjoyed the profits of some clerical endowment, d there is one cardinal among them. Many of them, d most who attained to any stable repute, were, as ght be expected, general scholars, and their learned ormation with regard to medical matters was only cidental. The impression produced on Dr. Russell his studies, as it will be by those who read his say, is that these medical authors were a highly spected group, as often rewarded for other activities for any professional medical service. The documents of the time do not discriminate between the asters of medicine and the scholars whose chief im to recollection is their record of other activities an those of medicine, and often, as Dr. Russell ys, only chance mention enables the label of ysician to be affixed to their names. It is thus necessary for any who write on the general society of the thirteenth and fourteenth centuries to remember that the careers of those ancient writers cannot be used as typical of the general status of the medical profession of the day—they may have been as learned physicians as any of their time, for otherwise they would not have received the distinguished patronage of the Crown and the Church, but they dropped into medical authorship as incidentally as Silas Wegg dropped into verse. Actually their contributions to therapeutics in many cases remain unestablished, for it is clear from the copious references to their writings appended to Dr. Russell's essay that a great deal of work for the literary antiquarian remains to be done. Among these references the author of the famous work, "Rosa Medicinæ" apparently has escaped notice, but John of Gaddesden was of the epoch described, and has been credited by Norman Moore as suggesting Chaucer's "Doctour of Phisik." A delightful account of him was written some years ago by the late Dr. H. P. Cholmeley as a thesis for a doctorate.

SWISS MEDICAL YEAR-BOOK

THE *Schweizerisches Medizinisches Jahrbuch* for 1935 shows many improvements on earlier editions. It is because the country is small and compact that a medical survey can be so concise, but it is greatly to the credit of the editors, Dr. Felix Barth of Basle, Dr. Otto Leuch of Zurich, and Dr. (jur.) Hans Trüeb of Berne, that it should also be readable and attractive. The first hundred pages or so are taken up by a series of biographies and reviews, including a valuable conspectus of new drugs by P. Wolff of Geneva. Among the appendices are useful articles on the use of microscopic stains by the practitioner and on the removal of drug stains from fingers and clothes. The photographic illustrations of the various baths and health resorts are excellent. The Jahrbuch may be had from Benno Schwabe and Co., Basle, for nine Swiss francs.

LUIGI CORNARO[1]

Mr. George Cooke, in a preface of 31 pages, introduces us to an essay of 20 pages and 10 pages of mixed material consisting of a topical biographical note, some maxims on the prolongation of life by an unknown seventeenth century writer, and an essay by Addison extracted from *The Spectator*. The meat inside this considerable crust is an English translation of Luigi Cornaro's "Treatise on Temperance and Sobriety." In this work, which from internal evidence appears to have been written when the author was about eighty, the virtues of self-control life are set out, the conclusion being "that an orderly life is the most sure way and ground of health and long dayes, and the true and onely medicine of many diseases." Cornaro practised his rules of living with such success that he became a centenarian, and according to his grand-daughter, a Paduan nun, his mind did not decay, his sight and hearing were not affected, and, which is more difficult than the rest to believe, he sang at the end of his life "with as much strength and delight as he did at the age of 25 years." There seems insufficient material in the treatise to furnish ground for comparison of Cornaro's system of life with modern theories of diet, that being the task which Mr. George Cooke has set himself in the introduction, while the points which he puts out for the instruction of those who would enjoy a long and healthy life follow the teaching of many dietitians. His appreciation of the significance of figures may be judged by the fact that he does not seem to think an expectation of prolongation of life of about five years, as between 1871 and 1921, a considerable one.

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[1] *How to Live for a Hundred Years and Avoid Disease.* A Treatise by *Luigi Cornaro*, the sixteenth century Italian centenarian. Translated by George Herbert, with an introduction by George Cooke. Oxford: The Alden Press. 1935. Pp. 63. 2s. 6d.

ADDRESSES AND ORIGINAL ARTICLES

RESPIRATORY AND VASCULAR CHANGES IN THE MAMMAL BEFORE AND AFTER BIRTH *

BY SIR JOSEPH BARCROFT, C.B.E., F.R.S.
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THE object of my lecture is to give you, in so far as I can, some consecutive idea of the respiratory and vascular changes which occur in the fœtus during birth. As a preliminary, therefore, I must say something about the life led by the fœtus; I must further make it clear that the information which I have been able to procure mostly from experiments on sheep has been elicited from Cæsarean sections.

Imagine then that there is in front of you a bath of such a size that it will contain the body of a sheep or goat, while the head projects from it and is supported by the back of the bath. The sheep is under an anæsthetic, which in most of my experiments has been urethane, but in some the animal has been rendered insensitive to pain by the injection of starch grains into the carotid artery—a procedure which was shown by Prof. Langley (1923) to be the equivalent of removal of the higher centres. The abdomen is in the bath and is immersed in saline solution; it is opened and the uterus exposed; the uterus is then opened and the fœtus withdrawn. The fœtus is now lying entirely immersed in saline at about 100° F., but with its circulation unimpaired and of course attached to the placenta by the cord. Perhaps the first thing which strikes you is that the fœtus is flaccid and movement only occasionally takes place, the second is the strength of the pulse in the cord, the pulsation being easily visible owing to the movement of the cord produced by each heart beat.

The strength of the circulation in the cord prompts the question: how much blood does the fœtal circulation contain? Another question follows closely upon the heels of that one: what proportion of the blood is in the fœtus and what proportion in the placenta?

Blood Volume

The fœtal blood volume has been fully investigated by Elliott, Hall, and Huggett (1934), who found that, relatively to the weight of the fœtus itself, the blood volume was very large in the early stages of fœtal life and, though increasing absolutely, its ratio to the fœtal weight became progressively smaller as time went on. At birth the fœtal circulation might contain for a kid of about 3 kilos. 500 c.cm. of blood. The gist then of the work of Elliott, Hall, and Huggett was that at birth the quantity of blood in the fœtal circulation, including the placenta, was about 15 per cent. of the weight of the fœtus, and that after birth the mass of circulating blood bore the same relation to the weight of the kid. If this be true one of two things must follow: (1) either the quantity of blood in the placenta and cord is negligible, or (2) the blood from the placenta is collected into the fœtus at birth.

In sheep I have made some observations to ascertain what proportion of the whole fœtal blood was actually in the fœtus and what proportion in the placenta and cord with the results shown in Table I.

We are left then with a picture of the fœtal circulation as divided into that of the fœtus itself and that of the cord and placenta. The former contains one-half to three-quarters of the blood, the latter from one-quarter to one-half. We have reason too to suppose that the blood from the placenta, or most of it, is withdrawn into the fœtus at birth. This point will arise later. The reason why the blood volume becomes proportionately smaller as the fœtus grows is that the fœtal circulation includes not only the fœtus itself but the fœtal vessels in the placenta. The placenta does not grow pari passu with the fœtus but before it, and therefore in the earlier stages of pregnancy the placental circulation forms a much greater proportion of the whole fœtal vascular bed than it does later on. It would be an exaggeration to say that a small fœtus consisted functionally principally of a heart which pumped blood through the placenta, but the exaggeration would be no greater than that legitimately allowed to the caricaturist who produces a more telling likeness than the realist.

TABLE I

Serial number of sheep.	Fœtal age in days. (Period of gestation about 150 days.)	Percentage of fœtal blood.	
		In fœtus.	In placenta and cord.
6	84	57	49
7	96	48	52
11	111	66	34
19	137	73	27

Blood Pressure

It is necessary to distinguish clearly between the quantity of blood which is actually in the placenta at a given time and the quantity which irrigates it. The former is the measure of the vascular bed for the time being, the latter depends not only upon the bed but also upon the pressure with which the blood is driven through the placenta, that is the pressure in the umbilical artery. This is probably not very different from that in the carotid artery, and therefore the data given in Table II. may be taken as typical.

TABLE II

Serial number of sheep.	Fœtal age in days.	Artery.	Pressure mm. Hg.
12	49	Umbilical.	20
50	101	Carotid.	34
39	120	,,	46
15	123	,,	50
19	137	,,	72
27	138	,,	68
28	140	,,	76

In the last six weeks or so of pregnancy the arterial pressure of the fœtal sheep more than doubles; this in itself will make a great difference to the amount of blood which circulates through the placenta. Yet even so, up to birth the fœtus is essentially an organism with a low arterial pressure; in the operation of birth the pressure rises by 20 mm. of mercury, so that in the newly born lamb it has a value of about 95–100 mm. of mercury. Could we reverse the process and go back from the lamb to the fœtus, we should say that the fœtus had gone into a state of collapse.

In this connexion, and perhaps at the risk of forestalling some points which must arise later, we can discuss the annexed tracing (Fig. 1). It reads from left to right;

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* The John Mallet Purser memorial lecture, given at Trinity College, Dublin, on June 25th, 1935.

at the commencement it is a tracing of the arterial pressure of a sheep's fœtus approaching term, in fact 138 days old. At the end it is the blood-pressure tracing of a lamb newly born, and therefore the period which it covers, amounting to about five minutes, includes the whole operation of birth by Cæsarean section. I may justify the word birth by saying that the lamb lived a number of days in the laboratory fed by the bottle. At the commencement of the tracing the arterial pressure is about 63 mm. of mercury. At the point X the cord is tied; there is some rise of pressure which does not last, and the first breath (the breaths are indicated by arrows) took place 48 seconds after the cord was tied. Each breath is of the nature of a gasp or spasm, and is frequently associated with a general rise of blood pressure, but this rise of pressure is not maintained, and it is not till nearly five minutes after tying the cord that the organism can be considered as definitely launched; after that the blood pressure is maintained and the respirations become frequent and regular. Thus, remembering that in the last resort the two may be mutually dependent, we have separated the events of birth into two categories, the respiratory and the vascular.

The First Respiration

What is the cause of the first respiration? This takes place as the result of clamping the cord, but after a long delay. Three possible causes may be assigned as the one responsible for the first breath:—

(1) Oxygen want.
(2) CO_2 excess.
(3) Increased blood pressure in the brain.

The last seems an unlikely cause, but it demands more than a passing thought because, even before the first respiration, another phenomenon is apparent on the blood-pressure tracing—namely, a marked slowing of the heart. This is a feature, not only of fœtal asphyxia, but also of post-natal asphyxia and is attributed by Anrep's school to increased arterial pressure. But the first breath does not appear to be due to increased pressure, because it sometimes takes place in the absence of hypertension and sometimes as in the present case after the hypertension has passed off.

If excess of carbonic acid were the cause, it should be easy without occluding the cord to produce the breath by giving the mother mixtures of oxygen with large quantities of CO_2 to breathe. We have never been able to produce respiration in this way; indeed, the fœtus seems singularly unresponsive to CO_2 administered by this method.

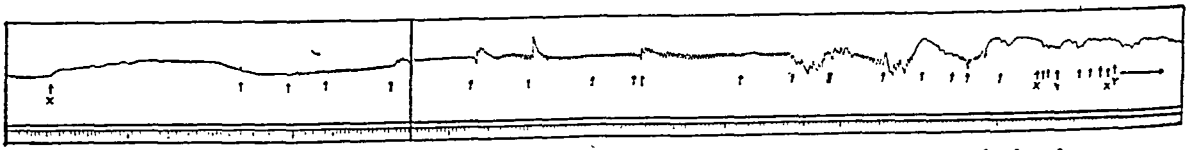

FIG. 1.—Tracing of the arterial pressure of a sheep's fœtus showing effect of tying the umbilical cord.

At X the cord is tied and at Y released. † = breaths. → = breathing continued regularly. The tracing is continuous except that, at the black line, one minute has been cut out in which nothing of moment happened.

That lack of oxygen may lead to respiration we have positive evidence.

(*a*) Other things being equal, the more blood the fœtus has in its body the greater will be its store of available oxygen and the longer should be the interval of time between occlusion of the cord and the first respiration. I have already shown that perhaps a quarter or a half of the blood is in the placental circulation. Advantage may be taken of this fact. If instead of pinching the whole cord the umbilical arteries only are pinched, leaving the umbilical veins free, the blood from the placenta, or a portion of it, should drain into the fœtus and in virtue of the oxygen which it contains postpone the first breath. This phenomenon can be produced with perfect regularity.

Fig. 2 shows three portions of the same tracing. In the uppermost (A), in which the whole cord was occluded, 41 seconds elapsed before the first breath took place; in the middle tracing (B), in which the arteries only were pinched, 57 seconds elapsed; while in the lowest one (C), in which the whole cord was blocked, 49 seconds elapsed. The middle tracing presents some points which indicate that blood from the placenta did actually find its way into the fœtus in quantity sufficient to affect the record. The immediate rise in fœtal arterial pressure consequent on the occlusion was much more marked and more sustained when the arteries only were occluded, and, a minute or so after the vessels were released, the middle tracing shows that the pressure became depressed to an extent which it did not in the first and last. Again, note that this depression was associated with intense slowing of the heart, which makes it difficult to argue that even the slowing of the heart was due to rise of blood pressure rather than to limitation of the oxygen supply of the brain.

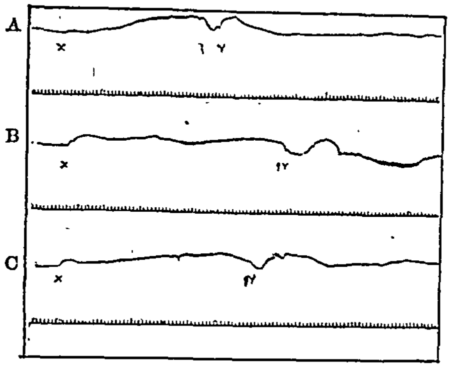

FIG. 2.—Three portions of a similar tracing showing effect of pinching—

(A) the whole cord, arteries, and veins,
(B) the arteries only,
(C) and subsequently the whole cord.
At X the vessels are pinched and at Y they are released.
† = breaths.

(*b*) If the first breath is due to want of oxygen, it would be satisfactory to produce the anoxæmia in some way which caused no upset to the circulation. Ordinarily such a method would be the administration of carbon monoxide: this standard method is not available in the present case because the carbon monoxide must needs be given to the mother and this, for several quite obvious reasons, would be unsuitable. We determined on the more heroic course of cutting down the oxygen content of the blood, by turning a portion of the fœtal hæmoglobin into methæmoglobin; this we did both by the injection of hydroxylamine chloride and of potassium ferricyanide, drugs which have little in common except their property of producing methæmoglobin.

Thus in a certain experiment (Sheep 39) in which the fœtus was quiescent but showed the usual phenomena on pinching of the cord, and in which pinching of one only of the two arteries failed to produce respiration, the injection into the umbilical vein of 65 mg. of hydroxylamine chloride in 2·5 c.cm. of saline produced respiration in 40 seconds. (Incidentally there was only a trifling rise in blood pressure and no slowing of the heart.) The effect passed off after a time, and a second injection was given which brought on respiration more rapidly and persistently.

Now it is clear that if this effect of hydroxylamine is due to the conversion of a portion of the fœtal hæmoglobin into methæmoglobin, the respiratory movements which it produces should be abolished by the injection of blood into the fœtal circulation. This in fact takes place. In the experiment just described, after the second injection of hydroxylamine had done its work and the respiratory movements had been established in a spasmodic way, 45 c.cm. of blood were transferred from the jugular vein of the mother to the fœtal circulation, with the result of immediately abolishing the spasms and bringing back the fœtus to approximately its original condition. And this alternation may be repeated. The proof, then, that the first respiration is due to depriving the fœtus brain of its oxygen-supply seems pretty clear.

I would enter one caveat here, and while I regard oxygen-want as the essential cause of the first breath, I am not prepared to say that the quantity of carbonic acid in the fœtal blood has no effect either in its magnitude or in the degree of oxygen-want necessary to cause it.

Before leaving the subject of the first breath let me say a word about its nature. I have spoken of it as a breath, but that quite inadequately describes it for it is a gasp, involving a great proportion of the muscles of the body. It may be questioned, indeed, whether the fact of air being introduced into the chest is much more than incidental. I mean that a general wave of contraction passes over a great part of the musculature of the body and since the diaphragm and intercostal muscles are powerful muscles the chest is opened. This gasp in fact seems to resemble in every possible way the dying gasp of an animal subjected to oxygen-want, say by cyanide poisoning or even deprivation of oxygen in the air; this is true in some detail, even to the order in which the muscles contract. From the point of view of the fœtus, the gasp is an index pointing, not to life, but to death, and we are faced with the remarkable paradox that the dying gasp of the fœtus is the earnest of life to the individual.

Slowing of the Heart

This remarkable phenomenon is so constant an effect of pinching the cord that it seems impossible to pass it over without taking a moment to consider its significance. When first I saw it, the idea struck me that it might have to do with the opening of the lung vessels that slow pulsations of large amplitude might, as it were, strike more effectively at the door and aid in opening up the vascular bed in the lungs more efficiently than would a rapid shallow pulse. That may or may not be so, but I do not think it is the important point.

Clearly there is hope for the fœtus to be born so long as the heart can beat. On what factors does the margin of time depend, between the cutting off of the placental supplies and the death of heart, in the event of birth not taking place? The heart presumably has at its disposal a certain amount of energy stored in some form or other, and can go on beating till this is exhausted. The energy which it uses in a given time is presumably a function of the initial tension at each beat multiplied by the number of beats; but in practice, as the initial tension does not vary very much, the energy at the disposal of the heart becomes exhausted proportionately to the number of beats which it gives. In other words, the heart can go into debt, oxygen debt or some other kind of debt, to the extent of a definite number of beats—say a thousand—so, clearly, the more slowly it beats consistently with preserving the blood pressure, the longer it postpones the inevitable end, should there be any difficulty in the establishment of the new respiratory and vascular conditions.

Course of Fœtal Circulation

One of the most obvious differences between the fœtus and the mother is that the former derives its oxygen from the placenta and the latter from the lungs. This change involves a fundamental alteration in the circulation. In the fœtus the blood which arrives at the heart may be divided into two categories. One portion comes along the inferior vena cava and consists of blood from the placenta and the lower part of the body. The second portion consists of blood coming from the head, the arms, the upper part of the trunk, and the coronary system. Let us first make an effort to discover what is the total volume of blood which passes through the fœtal heart per minute, and then we will pass to the consideration of the proportions in which these two main sources contribute to the whole.

The quantity of blood which passes through the fœtal heart per minute can be measured by a plethysmographic method. The great dangers of such a method are two: the first is lest it should give an incorrect measurement of the quantity of blood actually traversing the heart; the second, and perhaps the greatest, is lest the plethysmograph should restrict the blood flow. The present method was therefore calibrated in small animals against the blood flow as measured in other ways, and appears to give results too low by about 15 per cent. In calculating, the addition of 15 per cent. has been made to the figures as measured. The measurements gave singularly uniform results—namely, that, from the earliest date at which they were obtained until term, the volume of blood which traverses the heart is 0·15 c.cm.±0·03 of blood per minute for each gramme of the body-weight of the fœtus. These results were obtained in goats. They tend rather to increase as the fœtus grows older, but not outside the limits stated. It will be asked: how does this value compare with the quantity of blood which goes through the heart after birth? In fact the two are about the same. In making this statement I mean that the quantity of blood which traverses the fœtal heart is the same as that which traverses both ventricles after birth, and is therefore the double of what is ordinarily known as the minute volume—i.e., the volume of blood driven round the body per minute.

As regards the course of the stream, the information at our disposal comes chiefly from the researches of the anatomists. The classical picture they give is of relatively red blood arriving at the heart via the inferior vena cava, crossing directly through the foramen ovale to the left auricle, passing thence to the left ventricle, and so along the aortic arch and carotid arteries to the head. The dark blood from the jugular vein, brachial veins, azygos vein, coronary veins, &c., goes through the right auricle to the right ventricle and so along the pulmonary artery; such of it as gets to the body passes along the ductus arteriosus arriving in the aorta distally to the exit of the redder blood which goes to the coronary system, the head, the arms, &c.

It was naturally a matter of some interest to me to test the truth of the deductions made from an inspection of structure. The oxygen present in the blood at various fœtal ages and in various localities can be tested—not only so, but by studying both the composition of the confluents which form a given stream and that of the stream itself, the proportions in which the confluents mix can be determined. It is not necessary here to give all the details; summarised they amount to this:—

(1) The blood which passes through the heart may be regarded as forming two streams approximately equal in volume.

(2) One of these goes to the "head" and is not much inferior in its oxygen content to the redder blood which reaches the heart—namely, that coming along the inferior vena cava.

(3) The second, which is not much redder than the venous blood from the "head," goes to the "body," which means the lower part of the trunk and the placenta.

(4) Of the blood going to the "body," about two-thirds goes to the placenta.

The crossing therefore is nearly complete, almost every corpuscle which arrives from the placenta at the heart goes thence to the upper circulation, unloads oxygen in the head, the heart, the arms, &c., and then, traversing the heart again, goes up the ductus arteriosus and either unloads more oxygen, in fact most of its residual oxygen, in the body or goes to the placenta, there to receive another load.

This picture warrants a moment's thought, for, while it justifies the anatomical description, it seems to carry with it some implications which are not very easy. In the first place, on this showing, three times as much blood goes to the "head" as to the body. Can this be so? In order to find out the limits of the localities to which blood could go without passing down the abdominal aorta, the aorta was ligatured in fœtal guinea-pigs just proximally to the entry of the ductus arteriosus, a cannula was inserted into the left ventricle which was still beating and blue fluid was injected. As well as the actual head and arms, the whole of the chest wall was injected, and, what was very interesting, the coverings of the spinal cord down almost to the lumbar swelling. Thus all the organs which at this stage of fœtal life are functionally important, except the liver and the lowest section of the cord, can receive reddish blood from the upper circulation.

Now a word about the liver. It occupies a most remarkable place in the circulation which is very little stressed. The liver receives blood direct from the placenta—the purest which any organ receives—and therefore has a first option on whatever comes. In some animals, indeed—e.g., the horse, which is described as having no ductus venosus—the whole of the blood arriving from the placenta is poured into the portal vein and must traverse the capillaries of the liver before reaching the fœtal heart. Thus the liver of the fœtus is in as strong a position as that of the normal animal to receive and deal with everything that is necessary for the metabolic activity of the animal, all the products of absorption of foodstuffs as they diffuse through the placenta, as well as the necessary oxygen.

These considerations still further reduce the number of the important organs which are supplied with what may be called second-hand blood.

The Ductus Arteriosus

Another implication is as follows: if something like a third to a half of the blood leaving the heart traverses the ductus arteriosus, that vessel is one of the main arteries of the body and is in no sense an accessory or vestigial structure. Is it large enough to discharge this responsibility? If the ductus arteriosus is only capable of allowing the passage of 10 or 20 c.cm. of blood per minute, the picture which I have drawn is clearly an impossible one. Perfusion of the ductus arteriosus, however, shows that even in the cold and dead condition, when perfused at the pressure of the pulmonary artery, something like 120 c.cm. of blood per minute can pass along it. This is not quite the requisite amount, but it is of the right order.

I used the phrase "the pressure in the pulmonary artery." Here again is an implication, that the pressure on the right side of the fœtal heart must be much the same as on the left—namely, about 70 mm. Hg towards the end of fœtal life. Certainly the structure of the heart is not inconsistent with this conception, for at birth the thickness of the ventricle wall is approximately the same on the right and left sides. Therefore while the endocardiac pressure on the left side of the heart increases after birth that on the right side falls away to about 18 or 20 mm. of mercury—one-quarter of its fœtal value.

Here, however, is a more difficult question; if the efficiency of the fœtal circulation depends so completely upon the passage of a large quantity of blood along the ductus arteriosus, and the efficiency of the circulation after birth depends so completely upon the occlusion of the ductus arteriosus, it is rather difficult to visualise this closing as anything but a sudden process, either mechanical, such as a valve, or functional, such as a muscular spasm.

In this connexion the structure of the ductus arteriosus is interesting. It seems singular that its histology should differ materially from that of the arteries to which it is attached, yet that is the fact, for while the pulmonary artery and the aorta are highly elastic at birth, the ductus arteriosus resembles a small peripheral artery in its structure. The elastic elements are proportionately much less conspicuous and the muscular elements—or what seem to be muscular elements—are much more conspicuous than in the aorta or pulmonary artery. For the present, the closure of the ductus arteriosus must be left for further investigations which we have undertaken.

Respiration Before and After Birth

Without going into a detailed description of the events which take place in the placenta, suffice it to say that the oxygen passes from the maternal to the fœtal blood, so far as is known, by a process of diffusion. This process is greatly facilitated by the fact that fœtal blood has a considerably greater affinity for oxygen than the maternal blood. There are numerous ways in which such a result might be brought about. Perhaps the most obvious would be if the hydrogen-ion concentrations of the two bloods were different, and indeed it is true that the maternal blood during pregnancy is less alkaline than usual, a fact which tends to expel the oxygen from the hæmoglobin of the mother. But it is of the essence of the membrane which separates the blood of the mother from that of the fœtus that it should admit of the freest possible diffusion and therefore it cannot support any great difference of hydrogen-ion concentration on its two sides. It seems that the fœtus possesses a hæmoglobin of a different type from that of the mother, a hæmoglobin with a higher affinity for oxygen; this is true of the goat, the sheep, and the rabbit. The hæmoglobin of the chick also has a greater affinity for oxygen than that of the hen, and I believe even the tadpole's blood pigment differs in a similar way from that of the frog (Barcroft, J., 1935). Man at first sight presents the solitary exception, for the hæmoglobin of the human fœtus and even of the new-born child has a less affinity for oxygen than that of its mother, but this anomaly is set right when the hæmoglobin is not in solution but in corpuscles. We do not know what the essential difference between the pigment inside and outside the corpuscle may be, but, whatever it is, the effect of packing the hæmoglobin into the corpuscles is such that the pigment of the mother loses its affinity for oxygen to a much greater extent than that of the fœtus, and thus it happens that in the same buffer solution and at the same temperature the fœtal corpuscles in man, as in other forms, have a greater affinity for oxygen than those of the mother.

The relevant question is: at what stage does the fœtal hæmoglobin disappear and the post-natal hæmoglobin take its place? In the sheep this is almost exactly at birth. Up to the 138th day of fœtal life at all events there is no perceptible change. By the time the lamb is 39 days old the change appears to be complete, and even five days after birth it has gone a long way. Perhaps, however, the most remarkable thing about the transition is its nature. The affinity for oxygen is of course expressed by the oxygen dissociation curve, and it might be supposed that, given the pre-natal and post-natal types, the transitional type would lie between them so that it would be possible by mixing X c.cm. of typically embryonic blood with Y c.cm. of typically post-natal blood to get a blood the hæmoglobin of which gave an intermediate curve. This is not what takes place; the dissociation curve of the hæmoglobin derived from the blood at birth has a curve which is less inflected than that of either the pre-natal hæmoglobin or the post-natal hæmoglobin. Here again the chemical significance is not discovered. On the whole it looks as though the most likely explanation were not the right one and that the pre-natal pigment broke down in some way and was re-formed into the post-natal type.

From the point of view of function it must be borne in mind that, if the fœtal hæmoglobin has a greater affinity for oxygen than the post-natal type and so picks up the gas with ease in the placenta, reciprocally it gives up its oxygen with corresponding difficulty in the tissues. Is there any danger of the fœtus being asphyxiated because the hæmoglobin will not part sufficiently readily with its oxygen? This brings us to the question: does the fœtus use as much oxygen per gramme of tissue as the born animal? The coefficient of oxidation—to use the phrase invented by Chauveau and Kaufmann (1887) to express the number of cubic centimetres of oxygen used per gramme per minute—is known pretty accurately for goats at rest to be on the average 0·0085 c.cm. For kids in the first three days of life we have made a number of observations which varied from 0·005 c.cm. in a kid of 20 hours which had not been fed to 0·01 c.cm. ± 0·001 during the first week of life. This figure is in contrast to the metabolism of the fœtus. This is not easy to measure, and any measurement depends upon certain assumptions. The determination was first made by Zuntz and Cohnstein (1884), who did experiments upon sheep with results which varied greatly; their highest was 0·0025 c.cm. per gramme per minute.

We have done six experiments on goats and about the same number on sheep, and considering the difficulty of the task the results have come out with remarkable similarity. In the goat fœtus the coefficient of oxidation appears to be 0·0025 c.cm. ± 0·001. On the whole, as the embryonic age progresses there is a tendency for the coefficient to rise, but this is scarcely outside the region of experimental error. Then there is a great rise at birth. The kid a day or two old uses perhaps four times the amount of oxygen which it did when it was in the womb. The same appears to be true of the sheep. The conditions in the sheep fœtus seem so uniform that it is possible by a very simple calculation to arrive at the coefficient of oxidation. If the oxygen in the blood going to the placenta be subtracted from that in the blood emerging along the umbilical vein, and the figure so obtained—namely, the oxygen difference—be multiplied by the blood flow through the placenta, we shall get the coefficient of oxidation. Now we have already obtained a figure for the blood flow, by implication at all events. We have taken the blood flow through the heart as being 0·15 c.cm. per gramme of fœtus per minute, and we have taken the blood flow through the placenta as being the third of this—namely, 0·05 c.cm. per gramme per minute. Therefore the oxygen used per gramme per minute should be 0·05 c.cm., multiplied by the oxygen difference in c.cm. of oxygen per cubic centimetre of blood (Table III.).

TABLE III

Serial number of sheep.	Fœtal age in days.	Cubic centimetres of oxygen in 1 c.cm. of blood.			Oxidation coefficient of fœtus.
		Umbilical.		Difference.	
		Vein.	Artery.		
2	58	0·078	0·028	0·050	0·0025
8	98	0·088	0·048	0·040	0·0020
11	111	0·113	0·069	0·044	0·0022
14	112	0·157	0·104	0·053	0·0027
16	124	0·174	0·052	0·122	0·0061
19	137	0·068	0·017	0·051	0·0026
27	138	0·105	0·059	0·046	0·0023
29	144	0·102	0·038	0·064	0·0032

These results are (with one exception) practically the same as those of the goat, and as they too are very much less than the oxidation coefficient of the lamb we may take it that at birth there is a great increase in the quantity of oxygen consumed. Nor is this the whole story, for the vascular system of the born animal is made not merely to meet its requirements when at rest but to meet them when the organism is in the maximum condition of activity which it can sustain. This is true of the hæmoglobin no less than of any other feature of the vascular system. Therefore the hæmoglobin must in the active organism be able to unload its oxygen when the body is using oxygen not at the rate of 0·01 c.cm. per gramme per minute, but at perhaps ten times that rate.

But to continue the comparison between the organism before and after birth, in respect of the amount of oxygen which it requires, even the so-called resting kid or lamb is not at rest in the sense in which the word "rest" may legitimately be used of the fœtus. The greater part of the oxygen used by the body is used by its muscles; these are always in a state of tone. It used to be argued that muscular tone did not involve any extra use of oxygen and the so-called catch mechanism was invoked in support of this thesis. The new methods of amplification used by Adrian and others have shown that the true nature of tone in skeletal muscle is the contraction of a limited number of muscle-fibres in a given time. Tone must therefore be associated with oxygen use.

My colleague Dr. D. H. Barron has tested, at several periods of fœtal life, the question of whether the skeletal muscles of the fœtus are in a state of tone, and the result has always been the same—namely, that the muscles are perfectly flaccid so long as the fœtus is in its normal environment or in something approximating to it. Nor is there the same reason for the maintenance of tone in the fœtus that there is after birth. Once the animal is born, it is of the first importance that its body temperature should be maintained. This can only be done by oxidation, and even should tone develop into shivering the effort will be made. The fœtus, however, has no cooling surface of its own, and its presence does not greatly increase that of its mother, but in so far as it does, doubtless the maternal thermotaxic centre is equal to dealing with the situation.

The cogency of what has just been said has been proved by Barron in the following way: in warm saline and with the circulation unrestricted the fœtal muscles are, as I have said, devoid of tone. Take the fœtus out of the saline and expose its skin to the air; tone at once appears in its muscles, only again to be abolished by replacing the embryo in the saline.

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COMBINED DISTANCE RADIATION OF HYPOPHARYNGEAL CANCER

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The treatment of malignant disease of the region of the hypopharynx presents many difficulties. Surgical treatment has been placed on its present high level by the methods originated by Wilfred Trotter which remain the best that surgery can offer. They are limited however in their application to a small minority of cases, where the lesion is confined within the pharyngeal wall and the glandular involvement is limited. Even in such cases surgery is not always acceptable to the patient and the risks are grave in the most skilled hands. Some cases cannot be relieved without sacrifice of the larynx, and this grave mutilation is shown in its true light by Trotter's words: "I should not feel able to record as a true success the cure of a pharyngeal carcinoma won at he expense of laryngectomy." It is therefore natural that radiological methods should be tried out in this group of neoplasms. The outstanding advances in the radiological treatment can be summarised by the work of Coutard in France, Finzi and Levitt in this country, Zuppinger and his assistants in Switzerland, and the workers of the Memorial Hospital, New York, including Quick, Duffy, and Martin. As regards radium, the methods of interstitial and surface therapy have added very little to the practical treatment of these lesions; it is only when we come to mass radiation by large quantities of radium that improvements in results are recorded. In the radium treatment of cancer of the mouth, larynx, and pharynx by distance radium radiation, Berven stands alone as the pioneer of the treatment.

Our contribution to the treatment of cancer of the hypopharynx deals with a method of therapy which can be appropriately described as the "combined distance radiation." This combination of X and gamma radiation is applicable to most neoplasms, but at present we are only concerned with a group of tumours known to the clinician as "extrinsic laryngeal cancer," and including the hypopharynx. For radiological treatment as much as for surgical excision, correct diagnosis, accurate localisation, and careful grading or grouping of the lesions is essential.

FOUR ANATOMICAL GROUPS

The anatomical classification of the cases under consideration comprises the following four groups, which present different clinical features and require different techniques of treatment.

1. *Epipharyngeal Tumours.*—These are the true extrinsic laryngeal growths, originating in the aryepiglottic fold, epiglottis, or arytenoid. They give rise to early loss or modification of the voice and should be recognised with ease.

2. *Tumours of the Posterior or Lateral Pharyngeal Wall.*—In this group of cases the growth originates well away from the arytenoids, its possible level extends from the region of the uvula above to the post-cricoid area below; it may be confined to the posterior wall only or encroach on one or both lateral walls, or it may originate on the lateral wall. It extends inwards and may overhang the arytenoids and vocal cords, which, however, remain freely mobile.

3. *Pyriform Fossa Tumours.*—These constitute by far the commonest group. Early diagnosis is quite exceptional; glandular involvement is the rule and may at times be the first abnormality noticed by the patient. The mortality of this group is so high and operability so low that any other method capable of dealing with the disease must be seriously considered.

4. *Post-cricoid Carcinoma,* characterised by early dysphagia, the preponderance amongst women and the few signs visible on indirect examination in early cases. For such cases valuable diagnostic help can be obtained from careful skiagrams of the neck. The characteristic appearance is the displacement forward of the larynx and trachea and the ovoid shadow of the tumour prevertebral in position (Fig. 1).

In the clinical diagnosis of these cases we have had the advantage of the coöperation of a large number of laryngologists and we take this opportunity of expressing our thanks to them. The cases referred for treatment were seen and diagnosed by one or other of the following laryngologists: Mr. Gilbert Chubb, Mr. Douglas Harmer, Mr. F. C. Ormerod, Mr. W. Ibbotson, Mr. G. A. Simpson, Mr. N. A. Jory, Mr. Gill-Carey, Mr. N. Asherson, and Mr. E. Carew-Shaw. Our cases therefore were drawn from various hospitals, including Westminster, St. Bartholomew's, Mount Vernon, Ear, Nose and Throat Hospital, Golden-square, Central London Ear, Nose and Throat Hospital, and the Bolingbroke Hospital. Clinical diagnosis was always confirmed by more than one observer; in the majority of cases a biopsy and histological confirmation of malignancy preceded treatment.

HISTOLOGY

The histological classification of the tumours of the upper air and food passages varies from country to country; grading is somewhat arbitrary, and the following three groups cover the various types met:

(1) Squamous-celled carcinoma (with cell-nests).
(2) Transitional-celled carcinoma (without cell-nests).
(3) Lympho-epithelioma.

These three entirely different histological varieties of epithelial cancer may represent three phases of biological activity, the practical importance lies in the different life-histories of the three groups and their different degrees of radiosensitivity. Correlation between histological grouping and radiosensitivity showed that whereas lympho-epithelioma is always highly radiosensitive, the epidermoid type varies in its response and some squamous-celled tumours with cell-nests prove as sensitive as the more undifferentiated types. The gross physical characteristics of the lesion are as good if not a better guide to sensitivity than the microscopical grading. The cauliflower exuberant lesion responds better than the ulcerative infiltrating or nodular type, in accordance with the general rule. Sepsis, necrosis of tumours, or œdema militate against successful radiotherapy. Post-operative or post-radiation failures were not excluded from the series of cases treated by the combined method.

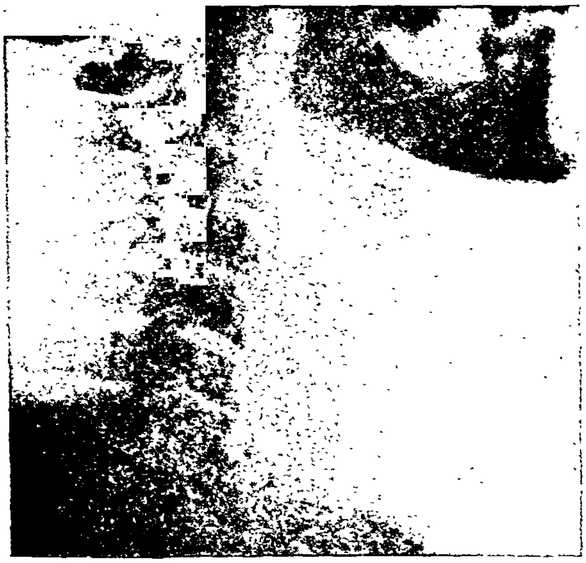

FIG. 1.—Skiagram of neck showing post-cricoid tumour and forward displacement of trachea. Note the distance between trachea and vertebral column; this is typical of the lesion.

TREATMENT

All patients were examined by indirect laryngoscopy; the situation, extent, and type of lesion were determined; oral hygiene and dental treatment precedes active irradiation. Skiagrams of the chest, neck, and a barium swallow are carried out; full blood counts are done weekly. The skin of the neck and the mucous membrane of the mouth are inspected daily, a complete laryngological examination is done weekly or twice weekly; in some cases daily. About one-third of the total number of patients treated are not hospitalised.

The method of treatment consists in a combination of radiation in the following order:

(1) Preliminary X radiation for 5 days.
(2) Simultaneous X and gamma radiation.
(3) Gamma radiation with the 2-gramme radium unit continued after cessation of X rays.

The use of radium and X rays in combination is not a new development. It has been used in many regions of the body, chiefly, however, by the method of needling with X rays as a preliminary or subsequent procedure. In America X rays have been used for several years in combination with the radium pack. Levitt, in 1930, stated that in the cases in which planned combined treatment was carried out, the results appear to be distinctly better than those treated by X rays alone. In many of these cases, he said, adequate treatment by radium alone would have been impossible in the first instance. In the treatment of the tongue, tonsil, and vallecula, he says also, that, where practicable, radium should always be combined with X rays. As far as we are aware, X rays had not been used in this country in combination with beam radium therapy previous to 1930, when the earliest cases were treated at Westminster Hospital. Since that date we have employed the combined method in many regions of the body, and in very varied types of malignant disease.

The remarks made by Quick at the International Conference on Cancer held in London in 1928 suggested a possible new method of attack on the malignant process. In speaking of the use of the 4-gramme radium pack and X rays, Quick says:

> "Our clinical observations were to the effect, that the practical results produced were superior to those where radiation of one wave-length only was used. We noted, furthermore, that bearing in mind the quantitative factor a relatively greater quantity of the combined radiation *within the limits of skin tolerance* could be given within a fixed interval than was possible where radiation of only one type was used."

Having at our disposal a constant potential X ray apparatus capable of giving 200 kilo-volts and a 1-gramme radium unit (afterwards increased to 2 grammes), we felt that this was an opportunity to test the method on carcinoma of the upper air passages. The rationale underlying the combined method is based on the following observations:

1. It was pointed out by Douglas Quick that a larger tissue dose can be given with safety and comfort by the combined method than by either method alone. If the total maximum dose given by each method alone is represented by 100 per cent., allowing a reduction of 25 per cent. for each type, a total dose of 150 per cent. can be delivered by the combined method.
2. It appears from observation of the cases treated that a variation of the wave length used increases the degree of radiosensitivity.
3. The local tolerance of the skin and mucous membrane is increased.
4. The limit of general tolerance of the patient is never reached before the limit of the local tolerance of the skin or mucous membrane, so that treatment need not be interrupted before an adequate dose is delivered.

TECHNIQUE: RADIUM

The bomb used is the fifth model constructed for Westminster Hospital (Fig. 2). It is of small dimensions, ovoid in shape, consisting of a spherical upper portion made of lead and a lower part cone-shaped made of gold. Its weight is 38 lb.; the external diameter is 14 cm., the internal diameter of the radiation channel is 3·5 cm.; the gold mouth is 1 cm. thick and 3 cm. long. The bomb is suspended over a pulley and counterpoised with a block of lead. It is easy to handle and stays in the position in which it is placed. A cone-shaped metal holder, the exact replica of the bomb, is accurately placed in position over the port of entry to be treated and fastened by rubber bands (Fig. 3). This is done outside the bomb room; the patient then comes into the treatment room, is placed on a couch which is swung into position under the bomb, and the attendant lowers the bomb into the cup; the bomb is attached to the cup in a few seconds. The radium contained in the bomb at present is 2 grammes in 9 tubes. The radium skin distance can be varied at will up to 7 cm.

Multiple small ports of entry are used. The number of ports varies with the situation and extent of the lesion and the presence of glandular metastases. Pyriform fossa lesions and lateral pharyngeal lesions are treated through 4 or 5 ports on one side of the neck; aryepiglottidean lesions through 3 ports on one side (Fig. 4) and postcricoid tumours through 2 ports one on each side of the neck; recently a third anterior central port has been added. The radium skin distance was originally 3 cm. but was gradually increased so that to-day 6 or 7 cm. radium skin distance is used in most cases. Each patient is treated 5 days a week and receives 2 treatments of 50 minutes each in the 24 hours. Occasional periods of rest, variation in the frequency of the treatments, and changes in the ports are dictated by the reaction of the skin and mucosa and by the response to treatment. The total period of treatment, including rests, extends over 6 to 7 weeks.

TECHNIQUE: X RAYS

A constant potential stabilovolt generator is used actuating a Siemen's multix 190 K.V. tube. Our kilovoltage has been 180 throughout. Filtration used 1·5 mm. copper + 1 mm. aluminium, except in the very early cases, when only 0·5 mm. copper was used. Lately a Thoraeus filter, which is equivalent to the 1·5 mm. copper, but which gives a more homogeneous beam, has been used. Focus: skin distance used is 45 cm. and at times 50 cm., and the size of the fields varies from 80 to 150 square centimetres.

As the metastatic spread is via the lymphatics, it seems to us that as widespread irradiation as possible consistent with safety should be used. Unlike Dr. Coutard and Dr. Hayes Martin, any ill-effects from the use of the larger fields have not been noticed, but this is most likely because the daily doses are smaller. Daily doses of from 120–180 r. units are given for five days a week, thus allowing two complete days rest in every seven.

Several minor variations to the main plan of treatment have been tried but the routine now is for the X radiation to precede the bomb on the affected side, or if the growth should be centrally situated or extend to both sides, for the X rays to be given to both sides before starting the gamma radiation. The bomb is then started and the X rays carried on with on the opposite side to the lesion and often from a posterior field in addition. This in many cases means that the X radiation is finished before the gamma.

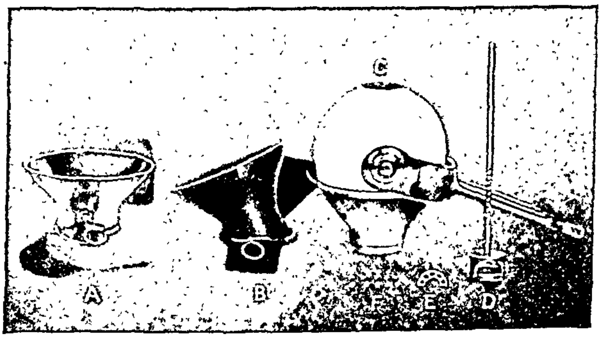

FIG. 2.—Components of the Westminster bomb. A and B metal cups, applied to patient outside bomb room. C bomb: upper part in lead, lower containing gold screen. D radium carrier, inside the bomb. E horse-shoe shaped container for five units of radium; this is inserted into D. F radium units, placed into E.

EFFECTS OF TREATMENT

(1) *Reaction of the skin.*—With increased radium skin distance, the cutaneous reaction has diminished in degree to a very appreciable extent. It is now possible to avoid moist peeling of the skin (Regaud's selective radio-epitheliitis). The appearance of erythema varies in individual patients; at 6 cm. distance, 10 hours' treatment can be given to each port before the erythema occurs. Dry peeling, pigmentation, and crusting are obtained towards the end of the treatment. It must, however, be emphasised that it is the mucosal reaction and not the skin reaction which is the determining factor of dosage, and treatment must be continued if other conditions dictate it, till full peeling of the skin is obtained. If blistering and peeling take place, healing follows in 10 to 14 days.

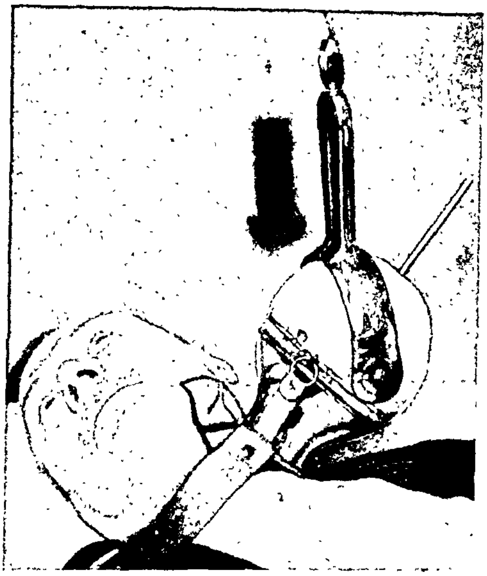

FIG. 3.—The bomb in position.

(2) *Reaction of the mucosa.*—Œdema of the mucous membrane, specially œdema of the arytenoids, is an early reaction; it occurs on the 3rd or 4th day, is transient, and gives rise to slight discomfort; towards the end of the treatment, œdema recurs and must be carefully watched; as a result of the treatment there is redness and dryness of the mucous membrane; occasionally a mild fungus infection of the palate and fauces occurs—this is an indication for interruption of treatment which can be resumed within a few days. *In two cases only,* both very advanced, was tracheotomy required in the middle of the treatment; in one case tracheotomy became necessary five weeks after cessation of treatment.

(3) *Perichondritis.*—No damage to the cartilages of the larynx or trachea has been observed so far up to periods of 3½ to 4 years after treatment. As this sequela is possible however as long as 7 or 8 years after cessation of treatment it cannot be excluded to date.

(4) *Blood changes.*—There is a progressive fall of leucocytes with *a greater relative* fall of lymphocytes throughout the treatment in the great majority of patients but not in all. The maximum fall is to 2000 total leucocytes and 250 lymphocytes. These changes are transitory, rapid recovery taking place during the periods of rest and on cessation of treatment.

General symptoms of radiation sickness are entirely absent.

CLINICAL COURSE

General constitutional disturbances have been very few and slight. A certain amount of depression, which is a very common feature, and loss of appetite, are the worst. We must remember as always that it is the patient we are treating and not alone the disease. This often necessitates modification of treatment, which would not otherwise be carried out. All factors relating to the general condition and habits of the patient must be considered. Whenever possible, cases are best treated as in-patients, thus avoiding daily journeys and fatigue, with risk of exposure to cold and infection. But neither the local reactions nor the effect on the general health are such as to preclude out-patient treatment throughout if the patient desires it. Smoking should be reduced to a minimum, or given up entirely where possible, but if this would militate against the patient's outlook, we prefer to let him continue. One inveterate smoker (as well as alcoholic) was treated with good palliative results, and lived in comfort for 16 months without renouncing either of his habits.

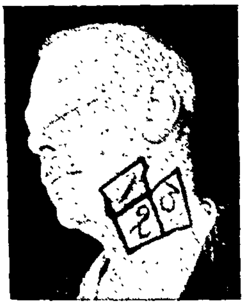

FIG. 4.—Ports of entry mapped out with Finzi's ink.

Frequent examination of the skin and mucous membranes is important, their exact condition being noted from week to week, if not from day to day, together with the state of the tumour. If not competent to make the examinations himself, the radiologist should seek the aid of a laryngologist or other clinician.

DOSAGE

The notation of dosage in distance mass therapy can be done by various methods. The total dosage could be indicated by milligramme or gramme hours; this, however, is most unsatisfactory unless all possible data are given—namely, quantity of radium, screenage, radium skin distance; frequency of treatments; duration of each treatment; total period of treatment; and number and position of ports of entry. Even then the dosage so indicated is the dosage given by the apparatus to any particular skin area. As the lesion-skin distance varies with the various ports and as the radium skin distance is also varied in some cases, the futility of such notation of dosages can be seen from Table I.

TABLE I.—*Dosage Data—2-gramme Bomb*

Based on measurements in water and assumption 1 imc. = 8·0 r/hr.

Ra-skin distance, cm.	Skin intensity in r/min.	Skin dose per hour in "r."	Percentage depth dose 10·0 cm. below skin.	Skin dose every hour in milli-grammes.
3·0	18·3	1100	5·8	2000
4·0	11·8	708	8·15	2000
5·0	8·3	498	10·1	2000
6·0	6·44	386	11·1	2000
7·0	4·75	285	13·2	2000

prepared by Mr. C. W. Wilson, assistant physicist to the Westminster Radium Annexe.

The only true method is to calculate or measure the dosage received by the tumour. For this purpose isodose curves have been prepared by the physicist of the department.* The intensity received by the tumour through various ports of entry can be obtained from the following curves prepared by Mr. Wilson (Fig. 5).

The total X ray dose on the tumour varies from one to two and a half erythema doses. This is made up by the fields already mentioned, and is approximately of the order of 1000 r. from the affected side, and 1300–1600 r. on the skin from the opposite side and the posterior field. No hard-and-fast rule as to the number of r. units to be given can be followed; every case must be judged as it proceeds and doses increased or treatment suspended according to the state of the tumour and the reactions. Numerous failures and increasing experience serve to strengthen our conviction that nothing short of the fullest possible dose on the tumour must be aimed at. This means that the skin will be damaged to a certain extent but this must be disregarded; if the treatment is given slowly enough, the skin will heal well and return to its original state. With larger quantities of radium and the possibility of still greater radium skin distances and harder X rays, it may be possible to deliver the necessary tumour doses without skin damage. In those cases where metastatic glands are present, the doses must necessarily be larger than where no palpable glands are noticed, as a larger volume of tissue has to be irradiated.

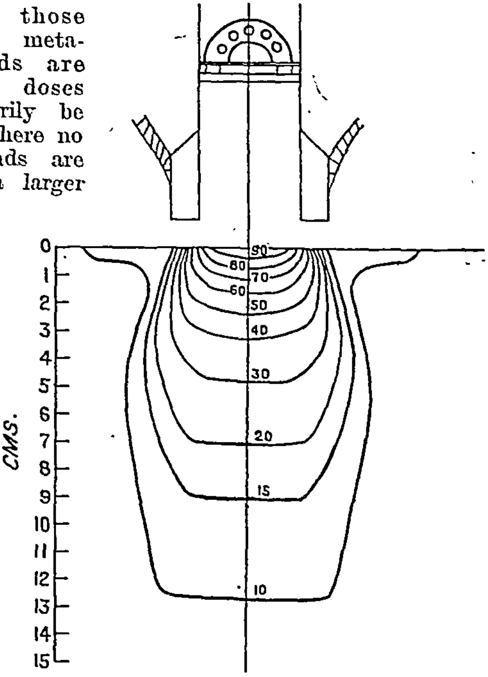

FIG. 5.—Isodose curves of the 2-gramme unit Westminster bomb. Radium-skin distance, 6 cm. Skin intensity, 8·0 r/min.

The total doses received by the tumour in the various successful cases is shown in Table II.

RESULTS

The number of cases treated by the combined method during the past three and a half years is shown in Table III.

The longest period of survival to date is three and a half years. One case died from other causes, free from disease by histological examination after complete post-mortem examination. Among the non-successful cases are two groups: (1) those, the majority, in which initial improvement and even total disappearance of the disease was followed by local recurrence within periods varying from 6 to 18 months; (2) those in which the disease progressed in spite of, and actually during the treatment.

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* See THE LANCET, 1933, ii., 4.

TABLE II

Case No.	Disease.	Tumour dose.		Time since end of treatment.
		Gamma rays.	X rays.	
		Total : r units.		
1	Pyriform fossa.	3,190	890	3 yrs.
2	,, ,,	4,400	790	1 yr. 3 mths.
3	,, ,,	5,800	997	1 yr.
4	,, ,,	4,950	930	9 mths.
5	,, ,,	2,940	1,600	7 mths.
6	,, ,,	—	—	—
7	Post-cricoid.	3,600	1,200	9 mths.
8	,,	6,200	660	—
9	Post-pharyngeal.	7,080	190	1 yr.
10	Epipharyngeal.	4,650	850	8 mths.
11	Tonsil.	7,140	530	5 mths.
12	Lat. pharynx.	6,720	530	5 mths.
13	Larynx gl.	11,500	540	—

TABLE III

—	Cases.	Alive and free from disease.
Pyriform fossa	23	7
Post-cricoid	10	3
Lateral and posterior pharyngeal	7	3
Epipharyngeal	12	4
Total	52	17

CONCLUSIONS

(1) The combination of X rays and radium is a deliberate attempt to treat extrinsic laryngeal cancer by an irradiation of different wave-lengths, as this appears to increase the radiosensitivity of the tumour and to lead to retrogression of the disease.

(2) The treatment is safe and, as compared with the intensive methods of Coutard in Paris or Martin in New York, produces less cutaneous and mucosal destruction and is well tolerated.

(3) No claims are made either as to permanency of results or to a great percentage of clinical cures. Of a total of 52 cases of hypopharyngeal cancer, 17 remain free from disease for periods up to three and a half years.

(4) Two grammes of radium is not considered the best possible quantity, and the intention is to increase the bomb to four grammes in the future, and further as opportunity arises.

(5) Finally a few words as to the future—the possibilities of this method have not by any means been exhausted. Many mistakes have been made, and from these much has been learned. The question is, Will the method be an improvement on previous methods ? The brilliant results achieved with X rays alone by Finzi and Coutard are well known. On the other hand, equally wonderful results are shown to us by Berven with gamma rays alone. Is there, then, any special virtue in the two agents when used together which is not possessed by each when used alone ? We know that there is a biological difference in the effect produced by (say) infra-red and ultra-violet radiation. Why should there not also be such a difference, when using widely differing wave-lengths of X and gamma radiation ? Many tumours, when treated with one type of radiation only, will proceed to a state of partial regression and then remain stationary or start again in active growth. It is our contention that, with the combined method, the number of such partial successes is very materially reduced, and that when the process of regression begins to slow down under one wave-length, the addition of the other supplies the necessary stimulus to complete healing.

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TREATMENT OF LOW-CALCIUM TETANY WITH CALCIFEROL

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LOW-CALCIUM tetany is met with in dietetic deficiency states, in disorders of the intestinal tract such as steatorrhœa, following thyroidectomy, and as an idiopathic condition probably due to hypoparathyroidism. It is with the treatment of the two latter that this paper is concerned.

Idiopathic tetany is rare, but owing to the frequency with which a subtotal thyroidectomy is now done, post-operative tetany is not uncommon. Many cases respond to calcium or acid medication, but others are met which cannot, by these means alone, be kept free from symptoms and some additional line of treatment must be sought.

As a treatment for an acute attack, parathormone, given intermuscularly is more convenient though less rapid in its action than the only alternative—namely, the intravenous injection of calcium salts—but its regular use over long periods has several disadvantages. It is expensive and, because of its relatively rapid action, difficult to control. Further, with prolonged use, there is some risk of decalcification and it has frequently been found to have a steadily decreasing effect.[1] [2]

As an alternative to parathormone various irradiation products of ergosterol have been given by mouth (for references see Reed and Seed,[3] Snapper,[4] Schultzer,[5] and Boothby).[6] Vitamin D, in the small doses used for the treatment of rickets, is usually ineffective in cases which do not respond to simpler methods of treatment. The following is a description of the course of three patients who have been treated for a considerable period on large doses of pure vitamin D (calciferol). In each case gelatin capsules containing 2 or 4 mg. calciferol (80,000–160,000 international units vitamin D) dissolved in olive oil have been used. A similar case was reported by Elliott [7] while the present paper was in preparation.

CASE RECORDS

CASE 1. *Post-operative tetany.*—On Jan. 5th, 1934, the patient, a woman of 24, underwent subtotal thyroidectomy for hyperthyroidism. The operation was quite straightforward and two small pieces of gland were left on either side of the trachea. The parathyroid glands were not seen. On the fourth day after operation a severe attack of tetany developed with laryngismus, carpopedal spasm, and a positive Chvostek sign; the serum calcium was 7·0 mg. per 100 c.cm. The attacks were controlled by parathormone, but recurred on discontinuing the injections. For the first nine days after operation there was an irregular pyrexia without any symptoms or signs to account for it. Fig. 1 shows the blood changes after the first six weeks after operation. The preliminary fall in the blood calcium is due to the discontinuance of parathormone treatment. From the first onset of symptoms the patient has had calcium gluconate grs. 180 t.d.s., and from the eighteenth week Thyroideum Siccum B.P. gr. ¼, t.d.s.

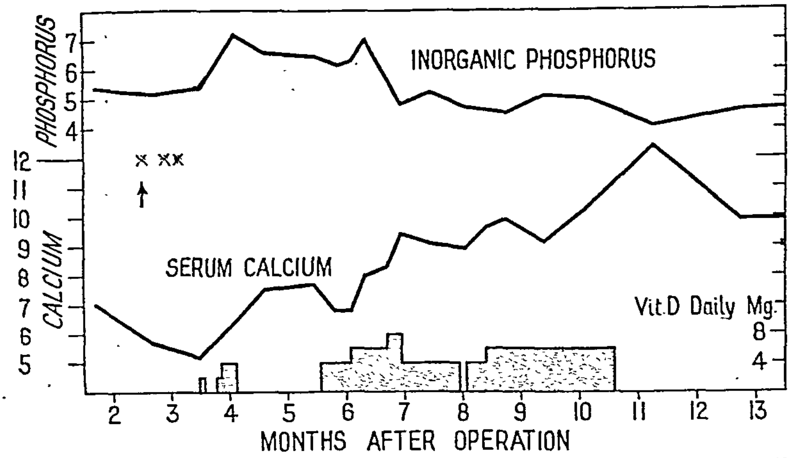

FIG. 1 (Case 1).—Changes in plasma inorganic phosphate and serum calcium with various doses of vitamin D. • = active tetany. ↑ = injection of parathormone.

CASE 2. *Post-operative tetany.*—The patient was 51 years of age and had a subtotal thyroidectomy done for toxic adenoma on Sept. 20th, 1934. Five days later active tetany developed and was controlled by parathormone injections and calcium gluconate grs. 180 t.d.s., for the following three weeks. Calcium gluconate has been administered ever since. On discontinuing the parathormone tetanic attacks occurred daily for a week when treatment with calciferol was started. The Table indicates the subsequent course throughout which tab. thyroid (sicc.) gr. ½ b.d., was given for a mild degree of myxœdema. After starting calciferol no cramps were experienced until Jan. 1st, 1935, when the serum calcium had fallen to 7·7 mg. per 100 c.cm. During the latter period, when the calcium ranged between 7 and 8 mg. it is interesting to note cramps were only experienced on the days immediately following the menstrual periods.

—	Serum calcium. mg. Ca. per 100 c.cm.	Plasma inorganic P. mg. P. per 100 c.cm.	Calciferol.
1934.			
Oct. 12th ..	6·7	5·7	None.
,, 25th ..	6·8	5·3	4 mg.
Nov. 2nd ..	8·1	6·0	4 mg.
,, 8th ..	8·1	5·2	4 mg. b.d.
,, 15th ..	10·7	5·4	4 mg.
,, 20th ..	—	—	Discontinued.
Dec. 21st ..	7·7	3·5	None.
1935.			
Jan. 30th ..	7·1	4·8	4 mg. b.d. for one week.
Mar. 14th ..	8·3	3·8	None.

b.d. = twice daily.

CASE 3. *Idiopathic tetany.*—Male, aged 33, a boot repairer. After an attack of influenza in January, 1933, the patient was seized with severe cramp in the hands. These continued intermittently, being brought on particularly, but not always, by work, till an exceptionally severe attack involving the muscles of the face and throat, making breathing difficult, brought him to hospital in March, 1933, in a typical tetanic attack. Blood calcium was then 6·2 mg. per 100 c.cm. He was treated with calcium chloride intravenously and parathormone and discharged free from symptoms with a blood calcium of 8·1 mg. As an out-patient he was treated on 2 pints of milk daily, calcium gluconate grs. 120 t.d.s., and Ostelin ♏ 3 t.d.s. (3000 units). Throughout the year he had invariably positive Trousseau and Chvostek signs with attacks of active tetany sometimes daily. At no time were there any other abnormal physical signs, nor any changes in skin, hair, nails, or lenses.

On Dec. 7th, 1933, when Fig. 2 starts, the calcium was 5·1, inorganic phosphate 8·0 mg. per 100 c.cm. A period of artificial sunlight resulted in a sudden rise in the calcium, a drop in the phosphate, and the disappearance of symptoms. A further period of artificial sunlight produced a similar effect on the phosphate but no corresponding rise in calcium. Shortly after starting calciferol both the Chvostek and Trousseau signs became negative. Fig. 2 shows the subsequent blood changes.

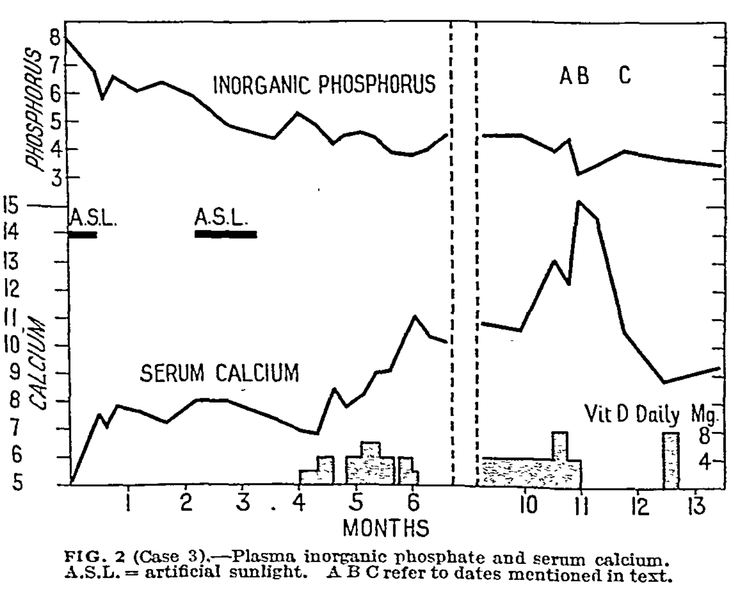

FIG. 2 (Case 3).—Plasma inorganic phosphate and serum calcium. A.S.L. = artificial sunlight. A B C refer to dates mentioned in text.

There has been one attack of active tetany only. This was not actually witnessed and all information concerning it rests on the patient's description. Three days later the serum calcium was 13·0 and the phosphate 3·5 mg. per 100 c.cm. Such attacks with a high calcium have been described by Reed and Seed.[3] The prolonged contraction of the small muscles of the hands which is required by the patient's work is a very sensitive test for latent tetany, and if the serum calcium is about 9 mg., cramps tend to develop after three or four hours' work when other signs of latent tetany are lacking. In his case, therefore, it is necessary to adjust the blood calcium with a greater nicety than would otherwise be needed.

ACTION OF CALCIFEROL

In all three cases the administration of calciferol in large doses has been followed by rapid relief of all symptoms. In Case 3 small doses of vitamin D, such as are used in the treatment of rickets, had been given without definite effect.

Concomitant with the relief of symptoms there was a rise in serum calcium. A distinct cumulative action is noticeable, the calcium continuing to rise without corresponding increase in dosage. On discontinuing the calciferol, the serum calcium does not at once return to its original level, but there is a delay of a month or more. For example, in Case 1, after the first period on calciferol, the serum calcium continued to rise for five weeks, and after the second it was well above the basal level ten weeks after the last capsule. Variations in the plasma inorganic phosphate follow a course roughly the converse of the calcium changes, tending towards a normal value. It will be noticed however that on starting on calciferol a sharp rise in the phosphate often occurs, followed later by a fall.

TOXIC SYMPTOMS

Reference to the literature for the toxic symptoms to be expected with calciferol is of little assistance because in most cases pure substances have not been used, and it is well known that the various irradiation products of ergosterol differ greatly in toxicity. Reed [8] states that large doses of viosterol produce: anorexia, nausea, vomiting, and diarrhœa; frequency of micturition without polyuria; loss of weight; muscular weakness, lassitude, dull aching in the muscles, muscular incoördination and disturbed equilibrium. In animals calcification of the heart, arteries, and kidneys has been produced and urinary calculi been found. Extreme overdosage results in decalcification of the bones.

In Case 1, after the patient had taken a total of 728 mg. calciferol during five months, she suddenly developed anorexia and occasional slight epigastric pains after meals. In six months her weight had fallen from 8 st. 4 lb. to 7 st. 11 lb. The hæmoglobin was 52 per cent. On discontinuing the treatment these symptoms at once disappeared; she started to gain weight and the hæmoglobin rose rapidly to 85 per cent. on iron. In Case 3 there was also a slight loss of appetite, but the patient's weight fell by only 3 lb. during four months in which he took 556 mg.

The urine has been examined regularly in all cases and there has been no albuminuria. The blood pressure also has remained normal and no abnormality of bone or kidney has been found radiologically.

In Case 3, with considerable calciferol overdosage and a serum calcium of 15 mg. per 100 c.cm., the serum developed a yellowish-brown coloration. The pigment was soluble in ether (unlike bile-pigments) and chloroform. No pigmentation of the skin or conjunctivæ could be detected. It was found that the depth of colour could be estimated satisfactorily by the icteric index, and the following Table indicates its subsequent disappearance. The letters refer to points in Fig. 2.

Date.		Icteric index.
Oct. 4th, 1934	A	23
,, 11th ,, ...	B	15
Nov. 1st ,, ...	C	10

In these cases then, provided there is no hypercalcæmia, some loss of weight and appetite, and in one case a considerable degree of anæmia, are the only toxic effects which have been observed.

METHOD OF TREATMENT

In treating a case with calciferol it is obviously necessary to supply adequate calcium in the diet for absorption and to minimise the risk of decalcification. To this end calcium gluconate and extra milk have been given.

The calciferol itself can be given either continuously or at intervals. The former requires, owing to the cumulative effect, frequent blood estimations. Recently the second method has been used with these cases and it has been found that a short period (e.g., seven days) on a fairly heavy dosage (4 mg. b.d.) is followed by a long period free from symptoms. A further short course is given when signs of latent tetany develop. The total amount of calciferol used is much less, if it is given in this way, and there has been no loss of weight or appetite. Periodic blood estimations are required to ensure against hypercalcæmia.

SUMMARY

(1) The progress of three cases of low calcium tetany, treated with calciferol, is described. (2) It has been found possible to maintain the patients free from symptoms with normal blood findings. (3) Possible toxic effects are discussed.

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AZOTÆMIA IN ACUTE BRIGHT'S DISEASE

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IT is not yet known how frequently the non-protein nitrogen (N.P.N.) of the blood is raised in acute nephritis, but there is evidence of an increase in a fair proportion of cases. MacLean [1] found that some accumulation of nitrogenous bodies in the blood takes place in all but the mildest cases, and Moorhead [2] stated that the blood-urea is almost always increased. Crawford [3] reports an increase of blood-urea in 70 per cent. of cases of acute nephritis in children, and Boyd,[4] also investigating children, found the N.P.N. of the blood to be very often above normal limits, while Lyttle and Rosenberg [5] observed azotæmia in 63 per cent. of 49 cases. Recently Murphy [6] and his collaborators recorded azotæmia in 71 per cent. of 94 patients, chiefly adults, suffering from acute nephritis.

Peters and Van Slyke [7] state that in acute nephritis the N.P.N. of the blood may be normal or very greatly increased; as a rule a moderate rise is found early in the disease. They have found that N.P.N. may be increased in the blood while a high concentration of nitrogen is present in the urine, and there may be actually a negative nitrogen balance. Hence they believe that azotæmia is not to be ascribed entirely to diminished renal function but is partly due to increased nitrogen metabolism resulting from the acute infection often present in acute nephritis.

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* The work was done during the tenure of a Carnegie research scholarship.

The present paper records the N.P.N. of the blood of 98 children, estimated at various stages of the disease. All the patients were under thirteen years of age, and one could be reasonably sure that they were all suffering from acute Bright's disease uncomplicated by chronic cardiac or renal lesions. The method used was that of Folin and Wu.

THE FINDINGS

Incidence.—The number of children admitted to hospital in the first week of the disease was 63, of whom 38 (60 per cent.) showed a N.P.N. over 40 mg. per 100 c.cm. (the upper limit of the normal), 7 having a concentration of over 100 mg. Of the 35 patients admitted in the second week of illness, 18 (51 per cent.) showed azotæmia, 3 having a blood N.P.N. of above 100 mg.

Relation to the Blood Pressure.—No relationship could be found between the level of N.P.N. and of the blood pressure; high readings were obtained with the sphygmomanometer when there was no azotæmia, and, on the other hand, a considerable rise of N.P.N. was not uncommon when there was no rise in blood pressure.

Relation to Œdema.—The amount of œdema gave no indication of the degree of azotæmia. Some cases with massive œdema showed no rise in N.P.N., while others, equally œdematous, had definite azotæmia. From Table I. it will be seen that the average value for blood N.P.N. in cases without œdema was no greater than in those with obvious dropsy.

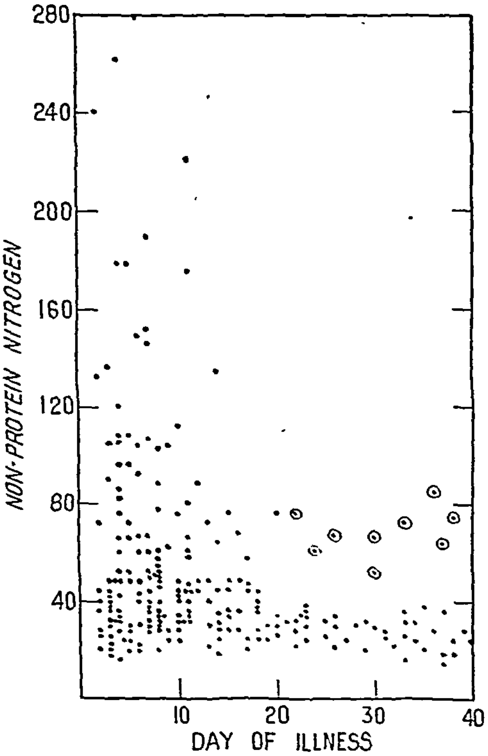

FIG. 2.—Azotæmia in acute Bright's disease (220 observations on 98 cases). ⊙ =persistence of azotæmia after third week, indicating grave prognosis.

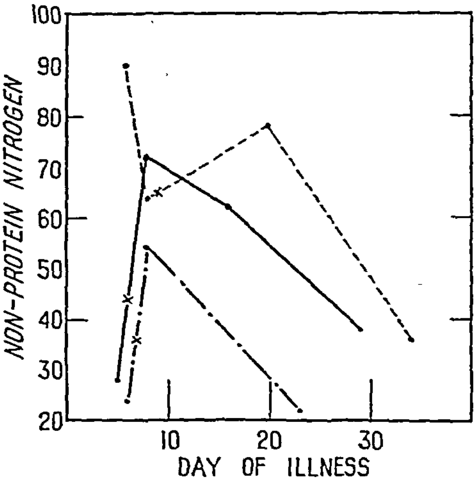

FIG. 1.—Rise in non-protein nitrogen (mg. per 100 c.cm.) after cessation of cerebral manifestation in acute nephritis. × =convulsions ceased following withdrawal of blood and cerebro-spinal fluid.

Cerebral Manifestations.—It is known that the N.P.N. is by no means constantly above normal in acute nephritis with nervous manifestations; nor is there any relation between the incidence or severity of the convulsions and the degree of azotæmia (MacLean,[1] Boyd,[4] Aldrich,[8] Nobécourt,[9] Holt[10]). Indeed Evans[11] has lately reported 7 cases in only 1 of which the N.P.N. was raised and that but slightly. Of the cases under my observation 12 showed cerebral manifestations, and 8 of these had azotæmia, the highest N.P.N. being 280 mg. per 100 c.cm. Two of these patients died. The level of the N.P.N. proved to be of no prognostic value: the patient with the highest level did not die although after eighteen months there is still evidence of kidney damage.

TABLE I

Œdema and Non-Protein Nitrogen

Œdema.	Cases.	N.P.N. mg. per 100 c.cm.	
		Average.	Range.
0	12	60·0	20·6–190·0
− +	29	49·6	19·1–113·0
+	27	55·4	22·4–176·5
+ +	30	63·5	17·0–280·0

One patient, semi-conscious on admission, with a N.P.N. of 280 mg., did not develop convulsions until four days later when that level had fallen to 133 mg. In 3 cases the N.P.N. actually showed an appreciable increase after the cessation of all nervous manifestations (Fig. 1).

VALUE OF N.P.N. ESTIMATION IN PROGNOSIS

Fig. 2 shows the results of 220 observations on 98 cases of acute nephritis. In all but 4 cases the azotæmia, when present, had disappeared by the fourth week of the disease. The observations made on these cases after the third week of the disease are indicated in Fig. 2 by ringed dots. Two of these patients died and gross renal damage persisted in the other two. The 5 other deaths in the series occurred from some complication such as pneumonia or meningitis.

In the large majority of cases a fall in N.P.N. coincided with loss of œdema, fall in blood pressure, and diminution of hæmaturia and albuminuria. There was no recognisable relation between the height of the N.P.N. at the commencement of the illness and the ultimate result. High levels were generally associated with satisfactory convalescence later, whereas 4 cases approaching the nephrotic type, with normal N.P.N., ran the usual chronic course. These results confirm the general opinion that little information can be gained from a single observation of the N.P.N. in acute nephritis. It appears, however, that repeated analysis is a guide to prognosis, since in the present series death or permanent renal damage occurred in all the cases where the N.P.N. remained above normal after the third week of illness.

TABLE II

Fall in N.P.N. of Blood with Comparatively High Protein Intake

Case.	Age in years.	Day of illness.	Diet.	Protein g. per day.	Protein per kg. body-weight (œdema free).	N.P.N. mg. per cent.
1	8	4	Milk.	44·0	2·6	96·7
		8				51·7
		12				49·1
		16				30·5
		24				25·0
2	10	6	Milk.	44·0	2·1	280·0
		11				222·0
		14				133·0
		20				32·7
		26				30·4
		32				23·0
3	6	3	Milk.	36·0	2·0	74·6
		11	Full diet.	63·0	3·5	30·9
		31				28·3
4	9	5	½ milk.	22·0	1·0	109·1
		7				105·2
		9				60·6
		11				49·1
		18				28·0
		25				38·7
5	5	5	½ milk.	22·0	1·7	179·4
		7				150·0
		9				103·4
		11				76·9
		18				36·6
		25				35·3
6	12	5	Milk.	51·0	2·1	48·7
		8				32·2
		13				32·4
		22				34·4
7	6	2	½ milk.	22·0	1·5	240·0
		4				263·6
		7				136·3
		12				44·7
		19				25·0
		29	Full diet.	63·0	3·5	32·0
		34				22·0
8	3	5	Milk.	44·0	3·4	35·7
		7				31·0
		10				30·4
		13				31·4
9	2	4	Milk.	37·0	3·7	26·2
		9				30·1
		20				31·5

RELATION OF DIET TO AZOTÆMIA

It has long been customary, because of the acute inflammation of the kidney and consequent diminution of renal excretory power, to impose on the patient with acute nephritis a very restricted diet, at least in the early stages of the disease. Protein in particular is held to be harmful, apparently because of the azotæmia. Ellis,[12] Fishberg,[13] and others have emphasised this point and recommend virtual fasting in the first days of the illness, only fruit juice and a quantity of water being permitted. More recently Bennett[14] has suggested that the fall in blood-urea in acute nephritis is attributable to this meagreness of diet, citing a case where a blood-urea of over 200 mg. per 100 c.cm. returned to normal in about ten days. While this is an attractive hypothesis, it should be mentioned that there are few figures available relating to behaviour of the N.P.N. in pati taking more food.

In the cases here recorded the routine diet admission to hospital was milk or milk and w varying in quantity with the age of the pati The amount of protein ingested ranged from 1 51 g. daily. In Table II. are shown 7 cases (Nos. in which azotæmia was present on admission an which the N.P.N. returned to normal within t weeks. Even from this small number it seems j fiable to conclude that fasting is not essential a rapid fall in the N.P.N. level, and that a consi able amount of protein in the diet does not inter with the fall. Table II. also includes 2 c (Nos. 8 and 9) in which the N.P.N. of the blood not rise, although the patients were having each over 3 g. of protein per kg. of body-weight.

These observations show that a diet of milk, taining a considerable amount of protein, has apparent adverse influence on the azotæmia of a nephritis. There seems to be no necessity for "fasting diet," since the N.P.N. falls spontaneou as the condition improves (Fig. 2).

It may be objected that the ingestion of s quantities of protein in the early stage incre the likelihood of residual damage to the kidney. meet this objection I shall briefly describe the su quent fate of the cases discussed in this paper, period of observation extending from January, 1 to the present date. There have been 7 deaths which 2 were apparently a direct result of the nephr and 5 were due to pneumonia or meningitis. patients were transferred to isolation hospitals taken home by their parents; about these no fa are available. The remaining 85 attend hosp as out-patients and 55 show no evidence of re disease. The other 30 have albuminuria of vary degree, 2 of them with moderate azotæmia a elevation of blood pressure. Some of these have been long under observation, but earlier experie suggests that a substantial proportion will make complete recovery. This recovery-rate compa well with others on record.[4,5,6,15] and indicates t a diet containing an adequate quantity of protein not an adverse influence.

SUMMARY

(1) Among 98 children suffering from acute nephri azotæmia was found in 60 per cent. of those fi examined within seven days of the onset, and 51 per cent. of those first examined in the second wee (2) The degree of azotæmia bore no relation eith to the amount of œdema or to the height of t blood pressure. (3) The non-protein nitrogen of t blood bore no relation to the incidence or the severi of the cerebral manifestations in acute nephrit (4) A single observation of the non-protein nitrog of the blood early in the disease is of no prognost value. In this series persistence of azotæmia aft the third week of illness is found to be of gra significance. (5) A sufficiency of protein in the di does not militate against disappearance of azotæm and has apparently no harmful effect.

I am indebted to Prof. G. B. Fleming, Dr. Stank Graham, and Dr. Noah Morris for their help.

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AMOUNT OF HÆMOGLOBIN IN THE BLOOD

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In spite of the many investigations which have been made on blood the following statements can scarcely be disputed:—

1. The amount of hæmoglobin in a given volume of blood cannot be accurately estimated.
2. The percentage of hæmoglobin relative to a "normal" standard is accurate only for the apparatus employed, and differs widely with different instruments.

This paper attempts to survey critically the hæmoglobinometers in present use, and the methods by which they are standardised. A method of determining the relative amounts of hæmoglobin in different bloods, and suitable for routine use, is also described. It depends upon a physical property of oxyhæmoglobin the measure of which is permanent, capable of exact assessment, and of being used as a reference standard for other forms of hæmoglobinometer.

METHODS OF ESTIMATING HÆMOGLOBIN

For clinical purposes it has been customary to compare the colours of solutions of hæmoglobin or its derivatives in order to estimate the hæmoglobin concentrations. Less commonly the light transmitted by a solution has been measured electrically. The other methods available, namely, to find the oxygen-combining capacity, or the iron content, or the extinction coefficient at the head of the α or β bands, are too complicated for routine use, but have been employed in standardising the colorimetric or photo-electric hæmoglobinometers, and for research purposes. They will be discussed here only in relation to standardisation of hæmoglobinometers, though they are really more fundamental methods of estimating hæmoglobin.

1. *Colorimetric hæmoglobinometers.*—The large number of papers which are still appearing describing new hæmoglobinometers is an indication of the unsatisfactory position of the technique. The colorimetric methods have various degrees of refinement. They have the great practical advantage that a simple portable apparatus only is necessary. They enable a single observer who is optically sensitive to colour shades to compare one blood with another, with an accuracy which may be sufficient for clinical purposes. Unfortunately, everyone is not sensitive to slight colour differences, and moreover different results may be obtained with the same instrument by two observers each believing himself to be colour-sensitive. This makes colorimetric methods objectionable for routine work in a large hospital where there are several observers. That significant errors are thus introduced is shown in Fig. 1, where readings taken with the Dare colorimetric method, formerly in routine use in the Hale clinical laboratory, are compared with a method to be described later. Colorimetric readings have the further disadvantage that, while differences in colour shade are easy to read in the lower parts of the scale, they are obscure in the higher parts, where a slight difference of shade represents an appreciable range of hæmoglobin concentration. They are also difficult to make in artificial light and in the presence of bilirubin. It is difficult, if not impossible, to compare colorimetric results from different laboratories for the above reasons, and also because there are also wide differences between the "normal" standard of instruments of various types.

2. *Physical instruments.*—Spectrographic methods were used for estimation of hæmoglobin concentrations at the end of the last century, although the instruments were crude, compared with the modern spectrophotometer. In recent years, photo-electric methods of measuring the light transmission through hæmoglobin solutions have been elaborated, as for example by Davis, Sheard, Sanford, and Osterberg.[1-5] These instruments have a great advantage over the colorimetric ones in that there is no personal factor, but they are usually more bulky and more expensive. There is no question as to their superiority for both routine and research work. The photo-electric hæmoglobinometer in routine use in the Hale laboratory is described in detail at the end of the paper. It differs from that of Sheard and Sanford in that use is made of the intense Soret absorption band on the border of the ultra-violet instead of the better known α and β bands.

STANDARDISATION OF HÆMOGLOBINOMETERS

(*a*) *General.*—Whichever hæmoglobinometer is used, a figure is obtained which is some function of the amount of hæmoglobin in the blood examined, and each type of instrument has to be standardised.

Ideally a hæmoglobinometer should be standardised on hæmoglobin solutions, made from known weights of pure dry human hæmoglobin crystals. Hæmoglobin crystals are difficult to prepare from any blood, and have only recently been reported as made from human blood.[6] Pure dilute hæmoglobin solutions can be made from blood, especially if low temperature rooms are available, but they are unstable. The ideal method of standardisation is therefore a counsel of perfection, at present impracticable.

(*b*) *Chemical methods of standardisation.*—The chemical methods which are available are two: to determine the iron content, or to find the oxygen-combining capacity. It may be taken that a solution of hæmoglobin, completely saturated with oxygen, contains as many atoms of iron as it does molecules of oxygen, although it is not known how the oxygen is attached.[7]

There appear to be two forms of hæmoglobin in normal human blood,[8] and it is an assumption that the relation between colour and oxygen-capacity of

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both are identical. The number of iron atoms per molecule of hæmoglobin is probably four; it was formerly thought to be one. The iron estimation has not been in common use for the estimation of hæmoglobin in blood, partly because there is iron in blood in other forms, although in small amounts. It has not often been used for pure hæmoglobin solutions as the analysis was until recently thought to be technically more difficult and less accurate than the oxygen capacity. But recently Alt [8] has compared the estimation of hæmoglobin from blood iron analyses with the Sahli, Newcomer, and Dare colorimetric methods; Brown and Briggs [9] have compared the estimation of hæmoglobin by iron and by oxygen analyses; Haden [10] and Dowden and McNeill [11] have also shown that iron estimations in blood are reliable, and advocate strongly their use for hæmoglobinometry. The above authors all use either the modified Wong [12] method, or Kennedy's [13] method. Either can be completed in 15 minutes, and the latter method does not require continuous attention during that time.

The oxygen-capacity can be measured by the Barcroft, Haldane, or Van Slyke methods. All these depend on the interaction between oxyhæmoglobin and potassium ferricyanide, for which no chemical equation can be written. It has been shown that the oxygen is liberated *almost* quantitatively. But in blood the potassium ferricyanide reacts to a slight extent with other substances besides oxyhæmoglobin, and also if the freed oxygen is left in contact with the reactants some of it is reabsorbed.[15-20] In the Barcroft and Haldane methods the oxygen is liberated into an air space at atmospheric pressure, and several minutes are allowed for equalisation of temperature before a reading of volume is taken. In the Van Slyke apparatus the reactants are very vigorously shaken for three minutes, and the gas is liberated into a vacuum. Its volume at constant pressure, or its pressure at constant volume, is then read as soon as the experience of the observer allows. Each of these methods gives reproducible results in the hands of an expert. The Van Slyke method tends to give the highest readings, and the Barcroft the lowest. It has been questioned whether the differences between the Van Slyke and Haldane methods are statistically significant.[21] It seems impossible to say which figure represents the true oxygen-combining capacity of the hæmoglobin in the blood. An added difficulty occurs when purified hæmoglobin solutions are used, as these very readily form methæmoglobin from part of the oxyhæmoglobin, and in this molecular rearrangement the oxygen is not freed by potassium ferricyanide. This introduces an error which is common to all three methods.

(*c*) *Physical method of standardisation.*—Hæmoglobin solutions may be compared by their extinction coefficients. The light, of a given wave-length, absorbed by a solution is related to the concentration and the thickness of the absorbing layer. By means of a spectrophotometer one can measure the relative intensities of the incident light (I) and the transmitted light (I′) for a given solution.

This ratio is related to the concentration (c) and the thickness (d) by the equation

$$\log_{10}\frac{I}{I'} = Ecd$$

where E, the extinction coefficient, is a constant for the substance in solution. This is known as Beer's law. It implies that log I/I′ is proportional to the product of the concentration and thickness of the solution, and that if the thickness be kept constant then the extinction coefficient will be proportional to the concentration. Provided that Beer's law is obeyed the extinction coefficient is a reliable constant. Newcomer [22] and Butterfield [23] have shown that the law holds for oxyhæmoglobin solutions for dilutions from 1 : 1 to 1 : 2000. We have confirmed the law over the range 1 : 100 to 1 : 5000.

Modern methods of measuring extinction coefficient are accurate to within ±2 per cent.[24] and results obtained with various instruments of different make and design agree very well with one another. From these considerations the extinction coefficient seems, at present, to be a reliable and universally reproducible standard for the standardisation of hæmoglobinometers.

METHODS OF EXPRESSING RESULTS

The amount of hæmoglobin estimated may be expressed either as the number of grammes in 100 c.cm. of blood, or as a percentage of the amount present in a "normal" individual. Both courses present difficulties.

A. *Hb. as grammes per cent.*—It is admittedly desirable, as some American workers [25-28] have recently emphasised, that the results should be expressed in terms of grammes of hæmoglobin per 100 c.cm. This, however, is not yet possible. To attempt to do so would, in our opinion, imply a false degree of accuracy. Peters and Van Slyke [29] are also of this opinion. They state: "The maximum volume of oxygen combining with 1 g. of hæmoglobin is a value concerning which we have, for human hæmoglobin, no reliable data."

In expressing hæmoglobin concentration in grammes per cent. it has been customary to use the figures given by Hüfner [30] in 1894. He stated that 1 g. [illegible] oxyhæmoglobin combines with 1·338 c.cm. of [illegible] at normal temperature and pressure, and [illegible] 0·336 per cent. Fe. With these factors [illegible] of hæmoglobinometers by chemical [illegible] has been translated into grammes of hæmoglobin per 100 c.cm. This has involved two assumptions. First, that Hüfner's figures are correct, [illegible] that the values are the same for ox and [illegible] hæmoglobins. Hüfner's paper is in a journal which is perhaps not easily accessible, and cannot have been widely read. His figures were obtained in the following way.

[illegible] assumed that the oxygen capacity was equal to [illegible] CO capacity. He separated corpuscles from plasma, diluted them with 0·1 per cent. NaOH to four times the volume of the blood from which they were obtained. [illegible] reduced the oxyhæmoglobin completely by letting it [illegible] overnight with hydrazine hydrate. The N_2 which [illegible] evolved in the reaction was removed by suction with a filter pump. The flask of reduced hæmoglobin was then attached to a vessel containing pure CO [illegible] manometer, and the change of gas volume due to [illegible] CO was measured. The amount of hæmoglobin in the solution was then estimated spectrophotometrically (in 1894!) by finding the extinction coefficient of a solution made from dry hæmoglobin crystals prepared from ox blood. Eight solutions were analysed in this way, 6–10 readings being taken of each. A correction had to be applied for dissolved CO. An attempt was made to do analogous experiments on solutions of hæmoglobin crystals, but very discordant results were obtained. This Hüfner attributed to the difficulty of getting the crystals alcohol-free, but it may have been due to the instability of pure hæmoglobin solutions, which has been found by later workers and has prevented them from repeating his work.

It is obvious that Hüfner's method of determining the oxygen-capacity cannot be compared with current methods. The figure he obtained, however, was confirmed by that calculated from iron analyses on ox hæmoglobin crystals, one preparation being analysed by himself and another by Jaquet in Basle. The crystals were dried to constant weight, ashed in a muffle oven, redried and titrated with potassium permanganate. Haldane [31] did not place any reliance on Hüfner's figures. He pointed out that the results of individual experiments differed by 10 per cent.; he thought the method theoretically objectionable, and the arbitrary correction which was applied for dissolved CO of questionable accuracy and of important magnitude. Later, Hüfner tried the ferricyanide method, and found results at least 13 per cent. lower than he had obtained by his previous method.

It will be seen that the "Hüfner factor" of 1·34 cannot be considered a satisfactory standard on which to base calculations for the conversion of oxygen-capacity determinations by Van Slyke, Haldane, or Barcroft methods into grammes of hæmoglobin per 100 c.cm.

B. *Hb. as per cent. normal.*—The "normal" hæmoglobin has been reported by many observers, using various hæmoglobinometers, variously standardised. Some of the data have been summarised into a diagram by Peters and Van Slyke.[32] The large variation among normals is probably not due merely to differences in method and observer. There is also a change with age and difference with sex. There has been much discussion on the supposed differences between English and American bloods in regard to hæmoglobin concentration. The 100 per cent. of the Haldane hæmoglobinometer is based on the estimations of Haldane and Smith,[33 34] which show that the mean percentage oxygen-capacity of 14 "normal" English individuals was 18·5 c.cm. per 100 c.cm. blood. The figures obtained varied between 16·0 and 20·9 c.cm. and sex or ages are not stated. They were obtained by making the subjects breathe a known volume of pure CO, and then estimating colorimetrically the percentage of CO in their blood. Hence the amount of blood could be calculated, and also the amount of CO, or oxygen, which would be necessary to saturate it completely, and the oxygen capacity per 100 c.cm. Here again the method used to find this "standard" figure is not one which is in modern use. Haldane [34] confirmed the figure later on 12 males, between 16 and 62 years of age, using the ferricyanide method.

Using the Haldane hæmoglobinometer Price-Jones [21] has found the mean of 100 male students in London to be 105 per cent., and that of 20 male students in Boston, U.S.A., using the same instrument, 112 per cent. The only difference in his experiments in the two places seems to have been that in England capillary blood was used from an ear-prick, while in America venous blood was used as more than one analysis was made on each sample. Oxygen-capacities were determined on the samples used by Price-Jones in America by the Van Slyke method in Dr. Dill's laboratory, and by the Haldane method by G. P. Wright. It will be noticed that the number of American students examined was small.

Price-Jones and Vaughan [35] have recently determined the hæmoglobin value of venous and capillary blood in 90 normal English males, using Haldane's colorimeter method. There was no significant difference between the hæmoglobin values for venous and capillary blood. The mean value for venous hæmoglobin was 105·46 per cent.; the possible limits of normal calculated as + and − three times the standard deviation were 120·44 per cent. to 90·48 per cent. These estimations were made by Vaughan using her own apparatus, including pipettes calibrated by one of us (P. M. T. K.), and the figures are in striking accord with the earlier series of Price-Jones in London. In order to establish the accuracy of the method as employed by Vaughan ten consecutive estimations were made on the same sample of blood. The mean obtained was 102·4 per cent. ± 0·18 per cent. The standard deviation was 0·8 per cent. ± 0·12 per cent. and the variability was 0·78 per cent. ± 0·12 per cent. In America the "normal" is usually taken to be 20·9 vols.[36] oxygen per 100 vols. or 15·6 g. Hb. per 100 c.cm. using Hüfner's figure, and this corresponds to about 114 per cent. on Haldane's scale. Sokhey,[37] using the Van Slyke oxygen method, found that the mean of 121 Indian males in Bombay was 111·3 per cent. Haldane. Jenkins,[38] in Salford, found a normal of 115 per cent. Haldane in a study of 53 males with a flicker hæmoglobinometer. Jenkins and Don,[39] using a Van Slyke constant pressure apparatus for oxygen determinations, tested bloods sent from London, Cambridge, Liverpool, Sheffield, Salford, and Altrincham, and found the mean to be 115 per cent. Haldane for 118 males, and 100 per cent. for 116 females. The figures ranged from 100–138 per cent. for males and 75–123 per cent. for females. It may be objected to this work that the samples were sent from far to be tested, and that the delay may have caused changes. Whitby and Hynes [40] found the mean Hb. of 50 normal London males to be 112 per cent., standard deviation 7·3 per cent., variability 6·5 per cent., limits 100–126 per cent., using the Haldane method. It seems unwise to conclude that there is a fundamental difference between English and American bloods while the techniques are still so difficult and the normal is so variable.

DISCUSSION

From the foregoing considerations it is clear that there is a great need for some basis of standardisation of hæmoglobinometers which would render hæmoglobin values wherever and however measured capable of direct comparison.

Obviously the most satisfactory means of standardisation would be afforded by known concentrations of pure hæmoglobin. As this is not yet practicable, recourse has to be made to certain chemical and physical constants of hæmoglobin. Iron content and "extinction coefficient" at the head of one of the absorption bands of hæmoglobin are the most reliable and easily determined constants of hæmoglobin.

At the time we standardised our hæmoglobinometer the methods for determining iron were laborious and of doubtful accuracy, as mentioned above, and, having means for measuring the "extinction coefficient," we calibrated the hæmoglobinometer here described, using this constant as a basis. If, therefore, at any time pure solutions of hæmoglobin become available it will be possible to relate the "extinction coefficient" measured on such a solution directly to the concentration of hæmoglobin, and by that means refer the hæmoglobinometer readings to concentrations of hæmoglobin.

The question of normality is of secondary and local importance. As Haden suggests, it should be determined for each particular laboratory or locality. In our case we have taken the mean of 70 values obtained from members of the London Hospital staff and students as the "normal." Fifty of these cases were also very kindly measured by Dr. Janet Vaughan, using the Haldane method. From these cases we find that our normal corresponds with 105·5 per cent. on the Haldane scale with a standard deviation of 2·84 per cent. (Fig. 1).

The normal value has been translated into terms of extinction coefficient by parallel determinations with the photo-electric hæmoglobinometer and a Hilger quartz spectrograph with "Spekka" photometer on the blood of forty-two subjects whose blood varied in hæmoglobin concentration from 20 to 120 per cent. of the normal value. The details are given below.

We find that our "normal" corresponds with an extinction coefficient at λ 412·5 mμ of $1{\cdot}20 \times 10^3$ for a thickness of layer of 1 cm., from which can be calculated the fact that the Haldane normal corresponds to an extinction coefficient of $1{\cdot}14 \times 10^3$.

DETAILS OF PHOTO-ELECTRIC APPARATUS

The apparatus was designed for routine use in the London Hospital where 40–50 hæmoglobin estimations are made each day. It was therefore primarily required to be simple to work, rapid and accurate in the hands of the unskilled observer, and to be free from any variations which might require it to be continually tested or recalibrated. The question of portability did not arise as all determinations could quite easily be made in the laboratory where the instrument is permanently housed in a cupboard. The electrical circuit, which is standard practice, was chosen for its accuracy and simplicity. A 0·5 megohm resistance (R_1) is connected in series with a potassium vacuum photo-electric cell and with a 36 volt battery which supplied the accelerating potential. The potential difference across R_1 is proportional to the photo-electric current. This potential difference is measured by means of a slide-wire potentiometer and sensitive galvanometer connected as shown in the diagram (Fig. 2).

Of the three characteristic absorption bands of hæmoglobin *the "Soret" band at λ 412·5 mμ was chosen for* measurement for the following reasons: (*a*) The absorption of the Soret band is seven times more intense than that of either the *a* or *β* visible bands. This allows of measurement on volumes of blood which can be obtained from pin-prick samples 5 to 10 c.mm. (*b*) The Soret band is well separated from any other band. (*c*) Owing to its greater intensity errors introduced by pigments other than hæmoglobin—e.g., bile-pigments—are insignificant (<1 per cent.).

This region of the spectrum was isolated by two superimposed Wratten filters (Nos. 35D and 47). The light source is a 36 watt 12 volt car lamp which is run off accumulators. These are charged at a rate which is ⅛ ampere less than that taken by the lamp. In this way a steady light can be maintained (variation 0·5 per cent.) for an hour or two and all sudden fluctuations of the mains are eliminated. A circular flask, filled with water, absorbs heat rays and causes a roughly parallel beam of light to fall on the cathode of the photo-electric cell. It is usual in such an arrangement to hold the solution to be measured in a container, with parallel sides, the light traversing the cell horizontally. The cell may be open, the solution being pipetted in from above, or completely closed, the cell being filled and then one of the transparent faces applied and clamped. Both these methods require that the two faces of the cell should be parallel and that the dilution of the blood should be accurate. This necessitates (1) an expensive cell, (2) accurate measurement of blood volume, (3) accurate measurement of volume of diluting fluid. We have avoided (1) and (3) by reflecting the light beam so that it passes vertically upwards through the containing cell. This allows of having a cell with only one transparent face (at the bottom). In such an arrangement what will determine the amount of light absorbed is the total quantity of hæmoglobin in the container; *if the light beam were truly parallel the* absorption should theoretically remain constant whatever the dilution, provided that the amount of hæmoglobin in the cell remains constant and the light beam occupies the whole cross-section of the cell. We have attempted to fulfil these conditions in the apparatus. The containing cells, of which we have 20, are accurately *bored to the* same diameter and are made from some inert material. Discs are cut from first quality plate-glass and can be fixed at the lower end by means of a screwed ring. It is essential that all the hæmoglobin present should be fully oxygenated. We have assumed that with the dilutions we use (1 : 500) there is sufficient dissolved oxygen in the diluting fluid to ensure the saturation of the hæmoglobin in 10 c.mm. of blood.

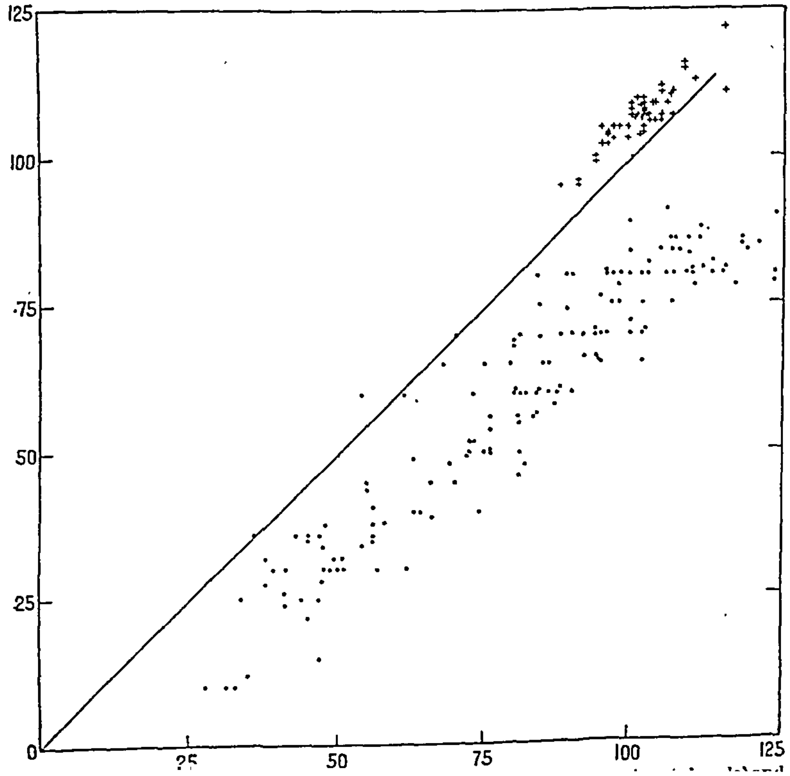

FIG. 1

the three instruments ga

PROCEDURE

The cells after cleaning are assembled, and into each are pipetted 5 c.cm. of 0·1 per cent. *sodium chloride* solution. This need only be a rough measurement. We have found that this diluting fluid gives us the most stable solutions of hæmoglobin, the usual alkaline fluids causing continuous and gradual conversion of the hæmoglobin to alkaline hæmatin. The strength we have chosen is such that the blood is completely hæmolysed and yet prevents precipitation of euglobulin. Each cell is covered with a lid. They are taken in batches of 10 to 15 into the wards. From an ear-prick 10 c.mm. of blood pipetted into one of the cells and the solution stirred once or twice with the pipette. The hæmoglobin should be determined within the next three hours. The light source and charging current are switched on about 10 minutes before measurements are to be made. After this time has elapsed the instrument is *standardised* as follows.

A slide is provided which holds a cell containing the hæmoglobin solution, and also an aperture closed with a piece of signal green glass, of known light-absorbing power. The slide is moved so that the glass is in the light beam. The potentiometer pointer is brought to the mark "standard." The galvanometer is brought to zero reading by a coarse resistance R_2 (Fig. 2) and a fine resistance R_3. The slide is now moved bringing the hæmoglobin into the light beam, then the galvanometer is brought to zero by adjusting the potentiometer. The reading of the potentiometer when read off against a calibration curve gives the hæmoglobin percentage of the blood. The procedure takes about 10 seconds. We usually make two or three readings.

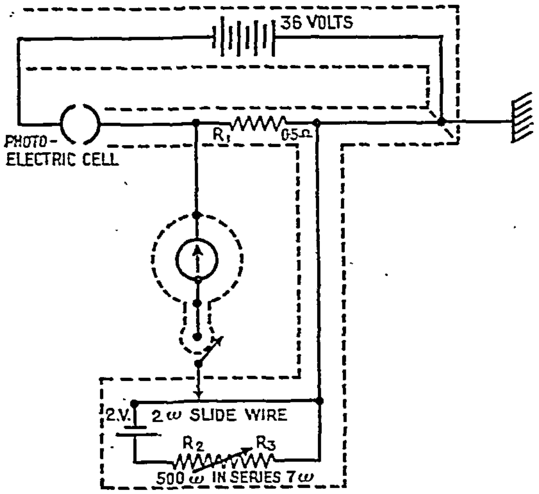

FIG. 2.—Plan of circuit.

CALIBRATION

The instrument is calibrated against values of extinction coefficient (measured on a Hilger quartz spectrograph (medium) with a spectrophotometer) for a series of 42 bloods. For each blood 4 dilutions were made and these measured both on the spectrograph and on the hæmoglobinometer.

In this way a curve was drawn through about 150 points relating hæmoglobinometer reading to "extinction coefficient." The standard deviation of points from the mean curve was found to be 0·25 scale divisions of the potentiometer for the whole curve. It is less for the weaker bloods and increases slightly for more concentrated bloods. In terms of hæmoglobin value it corresponds to a standard deviation of 0·1 per cent. for a 20 per cent. normal blood, 0·7 per cent. for a normal blood, and 2·0 per cent. for a 150 per cent. normal blood.

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OLD "LABORATORY" STRAINS OF THE POLYMORPHIC TRYPANOSOMES

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IN a recent paper on the chemotherapeutic susceptibility of trypanosomes, Browning and Gulbransen[1] describe a strain of *Trypanosoma brucei*, maintained in mice, as being at first "imperfectly accommodated" to this species of vertebrate host. During the early phases of its career in these little animals the trypanosome was found to be relatively resistant to various trypanocidal drugs. Later on, the strain became "highly accommodated and its pathogenicity increased to a maximum" and then the infected mice were readily cured with these same drugs. This description has suggested a few reflections from a different biological viewpoint, from one whose experience of these trypanosomes has been derived from strains freshly isolated from their natural environment in the tsetse areas of Central Africa.

Among the changes that may occur in trypanosomes during prolonged maintenance by direct passage in laboratory rodents two are of special importance. One is loss of the power to develop in tsetse, and the other is increase in virulence. A third character which may also change is pathogenicity to man.

TRANSMISSIBILITY TO THE TSETSE

The first phenomenon can only be demonstrated when clean tsetse are available in adequate numbers, and has been hitherto almost entirely overlooked in the routine evaluation of the characters of strains kept up in European laboratories. If, however, as indeed appears certain, *T. gambiense*, *T. rhodesiense*, and *T. brucei*, are essentially dependent on tsetse for their survival in nature, surely one of the most important of their many characters is the power to develop cyclically in the fly? Once a strain has lost this quality it retains for the student of human trypanosomiasis an interest mainly academic. There is good reason to believe that many old laboratory strains are actually unable to develop in glossina.

It is remarkable how completely this property of transmissibility has been ignored by most investigators of the polymorphic trypanosomes. At Hamburg, Reichenow and his colleagues have studied what appears to be a closely associated if not identical character, the culturability of these organisms in artificial media. Otherwise no one has yet attempted seriously to examine the accuracy of the conclusions reached on this subject in Uganda during the last ten years.

It seems to me probable from a careful study of Taylor's admirable work in Nigeria [2] that there were actually one or two non-transmissible strains among those under his purview. His main objective, however, led him in other directions and the opportunity has not recurred. In his introductory remarks Taylor thus refers to my views: "If this total loss of transmissibility occurs in nature with any frequency, and Duke's analysis of East African *T. gambiense* strains suggests this, then it would seem that *T. gambiense* strains are constantly becoming extinct, a conclusion of very considerable importance from the epidemiological standpoint."

My own experience of naturally occurring non-transmissible strains has been derived entirely from *T. gambiense* regions in Uganda and the Belgian Congo where *Glossina palpalis* is the only tsetse. Even here they were exceptional, and to demonstrate satisfactorily this peculiarity in the laboratory demands of course the dissection of large numbers of tsetse. I have met with only one non-transmissible "wild" strain of *T. brucei*, and none of *T. rhodesiense* in its typical form virulent to man.

VIRULENCE

The second modification, increasing virulence, may occur in nature. It is possible that direct transmission by glossina plays an accessory part in the spread of the *brucei* group in nature, in the form of epidemics in man or domestic animals. But an event of this kind is incidental to the normal propagation of these trypanosomes. In nature increasing virulence for a vertebrate host is actually an embarrassment to a trypanosome, and yet in the laboratory there is a tendency to regard it rather as a kind of adaptation of the parasite to its host.

An enormous amount of work has been carried out with trypanosomes in European laboratories during the last 20–30 years. Many of the strains used have been atypical derivatives from originals isolated many years previously, and although retaining little or nothing in common with their forebears save a general morphological resemblance, the old specific names are used. Thus we hear of strains of *T. brucei* killing rats in a few days, and stranger still, of a lethal *T. gambiense* that disposed of mice in 2–3 days. Clearly there is little resemblance between such strains and their ancestors fresh from human or ruminant blood; and it is not to be wondered at if confusion has arisen from the continued use of well-known specific names for these curiosities of the laboratory.

It has long been known that a strain of trypanosomes may change materially and sometimes quite quickly when once it is introduced into laboratory rodents. The normal vertebrate hosts of all the tsetse-carried trypanosomes possess one feature in common—namely, a considerable resistance against the protozoon. It is plainly in the interest of the parasite to do as little harm as possible to its host. For example, man's susceptibility to *T. rhodesiense* suggests that he should not be regarded as a natural host of this trypanosome. In nature, until perhaps recent years, it is unlikely that he is of more than secondary

importance as a host. In uncivilised Afric
T. rhodesiense invaded a human communi
either disappeared or the parasite gradually a
itself by assuming a mild *T. gambiense* f
which it had a chance of survival. A wild ve
as susceptible to *T. rhodesiense* as are the lab
rodents would certainly be rapidly extern
even if the tsetse ever succeeded in reaching i

Pathogenicity to man is an important ch
when we are dealing with freshly isolated strai
game or tsetse. But it is after all only one o
attributes possessed by a trypanosome. M
it is possible that this quality may appear, d
in a strain that has never before parasitise
together with other changes associated with
by direct passage in small rodents. Exag
importance is apt to be assigned to infecti
man. Are all the alleged instances of ac
laboratory infections of man with species of t
somes ordinarily supposed to be non-path
really due to carelessness and mixing of strain

LABORATORY CHANGES AND TRYPANOCIDAL D

A field biologist may well look askance
majority of the representatives of *T. ga*
or *T. brucei* in European laboratories. In
virulence is a common result of prolonged maint
of a trypanosome in rats or mice. There
evidence that the guinea-pig in course of time
a definite influence upon these organisms.
and I found indications of this in Uganda, a
Hoof and Henrard in the Congo. More r
I have found that both pathogenicity to m
transmissibility by tsetse may diminish app
to vanishing-point on maintenance of a str
guinea-pigs. Observations of this kind so
warning note, and in investigations of transmis
the guinea-pig should be avoided as far as poss

It is of course interesting to determine ho
old laboratory derivatives of the human trypano
can retain their power to infect man. B
interest is mainly academic. When once the
has in other respects ceased to be a human p
in the ordinary sense of the term. For ins
Reichenow's Hamburg strain of *T. gam*
isolated from an European in Fernando Po in
was found in Uganda to be still infective to m
subcutaneous inoculation in June, 1935.[3] Bu
same strain had in the meantime become com
non-transmissible by tsetse (*G. morsitans*
G. palpalis). Yet another point. It is easy to
an old laboratory strain of say *T. brucei* res
to drugs, and this resistance, as Yorke an
colleagues have shown, can be greatly enh
without diminution on cyclical passage th
glossina.

Certain strains of *T. gambiense*, on first iso
from man, also possess a considerable resistan
arsenic, and this resistance can presumably
easily be enhanced. It is sometimes assumed
such resistance has been acquired by contact in
earlier passage with arsenical drugs; *but it is eq*
probable that it is a natural feature of certain st
Typically, howe [illegible] is readily sen
to arsenic in [illegible] *It is ther*
interesting to note that hitherto all attempts to
a really sensitive strain of *T. gambiense* ar
resistant have been attended by serious impair
of the transmissibility of the strain by tsetse.
new arsenic-fast variant could not, in other w
develop in the fly. Admittedly this has been obs
so far only twice, once in Nigeria and once in Ug
But it is a point that should be settled, and

for a study of fresh strains and the employment of tsetse. Obviously the development of drug resistance in ordinary arsenic-sensitive *T. gambiense* has no practical significance if at the same time the strains become non-transmissible by glossina.

And here we may digress for a moment on an issue of real importance. There is no denying the danger of producing by improper treatment of native suffering from trypanosomiasis in *G. palpalis* and *tachinoides* areas strains resistant to arsenic. Arsenical drugs are acknowledged as useless in the routine treatment of *T. brucei* or *T. rhodesiense* because both these forms are naturally resistant to therapeutic doses of these drugs. But where *T. gambiense* occurs in its typical form, arsenic is effective because most strains are sensitive to its action. *T. brucei*, *T. rhodesiense*, and *T. gambiense* are, however, all very closely related, and in regions where they all three occur there is likely to be a considerable range of arsenic resistance in the strains isolated from man, for we can no longer confidently believe in hard-and-fast divisions between these three so-called species. In practice the danger can be met, as it is in Uganda, by combining with arsenical treatment a dose or two of Bayer 205. But it may be that this is not the best method and that arsenicals with their attendant dangers should give place altogether to Bayer 205 and its equivalents.

And the moral behind all these reflections? Surely to abandon the study in laboratories the world over of ancient and atypical laboratory strains of the tsetse-carried trypanosomes, and take up in their place samples recently isolated from their natural habitat. Study these until they start degenerating and then scrap them, and so build up a first-hand knowledge of the trypanosomes as they really are in nature. At any rate keep the two classes separate from one another. There is no need to alter the existing nomenclature, but merely our attitude towards old laboratory strains.

One result will be fewer disappointments over the claims made for new trypanocidal drugs, when the time comes to test them out in real life. Among the routine tests applied to trypanosomes should be included, as all important, their behaviour in tsetse. And when once a strain has lost the power to use its normal vector it should no longer be regarded as a true representative of the species from which it was originally derived.

Let us keep the distinction clear between natural and laboratory strains of the pathogenic trypanosomes and exercise due caution in transferring conclusions from one to the other.

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CLINICAL AND LABORATORY NOTES

TUBERCULOSIS OF THE NASAL SINUSES TREATED BY IRRADIATION

By W. Annandale Troup, M.C., M.D. St. And.

The forms of irradiation I use in the treatment of sinusitis are: (1) infra-red rays applied locally over the affected antra and sinuses; (2) ultra-violet rays, applied both postnasally and intranasally, by means of quartz applicators attached to the Kromayer mercury-vapour lamp; and (3) ultra-violet rays applied to the whole body by the titanium-alloy arc. The effects arrived at are dilatation of the ostia; establishment of drainage from infected antra and sinuses; increased flow of blood and lymph to the affected areas; increased bactericidal properties in the mucus secretion; regeneration of the mucous membrane and restoration of its normal function; and increase of bodily resisting powers. Success depends on accurate dosage, since varying stimuli evoke varying responses in different cases.

The value of the method is illustrated by the following case.

A man, aged 30, a patient of Dr. E. R. Keeble, was sent to me by Sir Henry Martyn, of Windsor, and first seen on Oct. 8th, 1934. Sir Henry wrote: "Physical signs started in this man's chest when he was fifteen years of age, and were diagnosed as pulmonary phthisis. The symptoms improved and remained quiescent until this summer, when he again had a flare-up with a prolonged burst of temperature. There were physical signs at both bases and at the apex of the left lung. Signs were confirmed by X ray examination, but at no time have tubercle bacilli ever been found in the sputum. The case was referred to me concerning the possibility of sinus infection. Both his antra were dark on transillumination, and on washing them out a clear return was obtained from the right antrum, but a considerable mass of dark translucent white mucus from that on the left. Examination of the washout showed tubercle bacilli in large quantities."

On Sept. 25th the sinuses were examined by Dr. H. K. Graham-Hodgson, who reported that radiography showed polypi in both maxillary antra, and some thickening in the lining membrane of both frontal sinuses (more on right than on left) and of the anterior ethmoidal cells. The right posterior ethmoidal cells and the right sphenoidal sinus were radiologically normal. The left posterior ethmoidal cells and the left sphenoidal sinus showed marked thickening of the lining membranes.

The patient weighed 13 st. 7 lb., and his height was 6 ft. 6 in. He looked debilitated and toxic, and had been running an evening temperature up to 100° F. for three months during which time he had been confined to bed. The joy of life had departed and the mental outlook was without hope.

Irradiation began on Oct. 8th. On Oct. 11th the evening temperature was normal, and the nasal and postnasal discharge much increased. On the 15th his weight was 13 st. 10 lb.; all acute pain had disappeared, and he said that his face no longer felt like a blown-up balloon. On Oct. 24th there was no pain in the occipital region and he was feeling very much better. On the 29th he had gained a further 3 lb. and was able to stoop without giddiness or tightness in the head. On Nov. 5th his weight was 14 st. 2 lb., and Dr. Keeble reported that all active physical signs in the chest have disappeared; by the 11th the evening rise of temperature had altogether ceased; and on Dec. 3rd the weight was 14 st. 6½ lb.

Dr. Graham-Hodgson examined the patient again on Jan. 17th, 1935, and reported that the maxillary antra were now clear-cut and well defined, the opacities previously seen being almost absent. The cloudiness in the frontal sinus had also very largely disappeared. There was still some thickening in the lining membrane in the ethmoidal cells and sphenoidal sinuses, but it was less obvious than before.

On Jan. 22nd the patient was examined by Sir Henry Martyn and the antra washed out. The washings came back quite clear, the fluid was sterile, and no tubercle bacilli were found. By Feb. 21st the weight was 15 st., and on April 5th treatment was discontinued. Dr. Graham-Hodgson's final report stated that there was still some slight cloudiness in the frontal sinus, but no X ray evidence of abnormality in either maxillary antra. There was also some thickening of the lining membranes in the anterior ethmoidal cells on both sides, but the posterior ethmoidal cells were radiologically normal. The lining membrane of the left sphenoidal sinus also showed very slight thickening. Sir Henry Martyn considered the patient fit to continue his duties, which he is now pursuing with greatly increased vigour and perfect health.

This patient had over 60 treatments in all, but it must be remembered that there was a history of over fifteen years, the infection was severe, and his state was drifting from bad to worse. I feel confident that with patience and perseverance many such cases now labelled "hopeless" could not only be relieved of their suffering but returned to the ranks of the healthy.

Sir Henry Martyn adds the following comment.

"The case is interesting both from the unusual character of the sinus infection and from the remarkable response to light therapy. As Dr. Watson-Williams has pointed out, it is common enough to meet with cases erroneously diagnosed as tuberculosis of the lungs, in which no tubercle bacilli have ever been found in the sputum, and which are, in reality, cases of chronic pyogenic infection of the sinuses, but it is certainly unusual to find the exact converse—a case of definite tuberculosis of the lungs, in which no tubercle bacilli had ever been recovered from the sputum, but in which they were present in large numbers in the sinuses. From the point of view of treatment the problem presented by such a case is serious in the extreme. To contemplate operative procedure with such extensive sinus involvement in a patient with advanced pulmonary damage would have been wholly unjustifiable. On the other hand, to anticipate that sanatorium treatment alone would be sufficient to allow a patient to overcome a sinus infection advanced to a degree of actual polypoid degeneration of mucous membrane appeared to be unduly optimistic. In light therapy we appear to have a weapon of the greatest value, and although it would be wrong to generalise upon a single case there would appear to be every justification for a more extended use of this method of treatment."

London.

FREE MELANIN-BEARING CELLS IN ASCITIC FLUID IN DIFFUSE MELANOMATOSIS

By W. R. Snodgrass, M.D., B.Sc., F.R.F.P.S. Glasg.
VISITING PHYSICIAN, SOUTHERN GENERAL HOSPITAL, GLASGOW

A married woman, aged 53, was admitted to Mr. Edington's surgical ward in the Western Infirmary on July 18th, 1931. A pigmented mole was removed from the left hip. Histological examination showed this to be a melanoma. In August, 1933, she developed malaise, discomfort after food, and vomiting.

She was readmitted to Mr. Edington's ward on Sept. 6th. The abdomen was much swollen, and paracentesis yielded, on separate occasions, 280 and 396 ounces of clear ascitic fluid. On Nov. 13th she was transferred to the Southern General Hospital, where paracentesis of the abdomen was performed eleven times, a total of 111¾ pints being withdrawn. She died on June 18th, 1934.

The illness was marked by progressive and extreme emaciation, and latterly irregular masses were palpable in the upper quadrants of the abdomen. At times there were attacks of severe diarrhœa, but the stools showed no blood, pathogenic organisms, or excess of mucus. At no time was the urine abnormally dark in colour. There was no fever.

The unusual feature noted was the presence of free melanin-bearing cells in the ascitic fluid during the last eight paracenteses in the Southern General Hospital. This black material appeared during the last two pints to be withdrawn and increased in amount towards the end of the operation. Palpation of the abdomen greatly increased the quantity of melanin withdrawn.

Paracentesis was performed in the midline above the pubis, and melanotic tumours developed in the sites of the needle tracks. These were bluish-black, firm nodules, well raised above the skin level.

Dr. P. R. Peacock, of the Royal Cancer Hospital, examined the ascitic fluid and reported that such cells as were recognisable appeared to be endothelial cells or phagocytes, probably macrophages, containing pigment which masked their histological features. Two fowls inoculated intramuscularly showed no lesion during several weeks of observation.

At post-mortem examination by Dr. J. N. Wilson, the abdominal viscera were found to be jet black owing to the presence of very numerous melanotic tumours in the omentum, and were matted together. Small pigmented areas were seen in the stomach and small bowel, and parts of the wall of the stomach and small bowel had the consistency of cardboard. The peritoneum and omentum were covered with black nodules. The heart, lungs, kidney, liver, and spleen were not affected. Secondary deposits were found in several ribs, and the mediastinal glands and right submaxillary gland were involved.

Dr. F. E. Reynolds, pathologist to Stobhill Hospital, examined a skin transplantation tumour and reported: "The nodule is lined by a thin layer of epithelium in which there are few 'epithelial pegs'; the deeper cells do not contain an excess of pigment. The neoplasm consists of a number of 'islands' in the subepithelial tissue. One of these is situated in the tissue immediately below the surface epithelium and is not involving the latter structure. The other islands lie deeper. The neoplastic cells are for the most part large and polyhedral and contain a large amount of melanin in the form of fine granules. In certain portions, however, the cells are almost devoid of pigment. Again, examples of small rounded neoplastic cells occur. Both in and around the islands it is clearly demonstrated that local spread of the neoplasm has been along lymphatic vessels and spaces."

The post-mortem findings indicate that the melanoma spread from the left hip by way of the lymphatic vessels accompanying the veins, involving the hypogastric lymph glands first. The freedom from infection of the lungs, heart, kidneys, and spleen suggest that it was never blood-borne. The skin deposits at the site of puncture show local transplantation, which in turn initiated lymphatic extension.

The case is reported because of its rarity. Undoubtedly the intracellular melanin was derived from the peritoneal and omental tumours. In Kaufmann's "Pathology" (1922, p. 1699) it is stated that melanin may occur in transudates but I have found no clinical reference to such a condition published since the war. In a total of 492 cases reported by Boulay (191),[1] Coley and Hoguet (9),[2] Gleave, H. H. (40),[3] Dawson (120),[4] and Butterworth and Klauder (50)[5] no reference is made to it. Incidentally the primary lesion occurred in the lower extremities in 115 out of these 492 cases.

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REVIEWS AND NOTICES OF BOOKS

Disorders of the Blood

By LIONEL E. H. WHITBY, C.V.O., M.C., M.D. Cantab., F.R.C.P. Lond., D.P.H., Assistant Pathologist, the Bland-Sutton Institute of Pathology, Middlesex Hospital; and C. J. C. BRITTON, M.D. N.Z., Assistant Pathologist, Christchurch Hospital, New Zealand. London: J. and A. Churchill Ltd. 1935. Pp. 543. 21s.

IN selecting the title of this comprehensive monograph the authors desired to emphasise the rarity of primary disease of the hæmopoietic system and how often changes in the peripheral blood are a symptom of a disease or disorder in some other system of the body. The work contains descriptions of the blood picture to be found in almost all the diseases known to man, from the recognised anæmias and leukæmias to infections and miscellaneous conditions such as allergy, coronary thrombosis, and diabetes. The opening chapter contains a discussion of the origin, development, functions, and fate of the cells of the blood, following on the whole the views of Doan, Sabin, and Cunningham. Three chapters are devoted to the principles and practice of hæmatological diagnosis; the methods of studying red cells, leucocytes, platelets, and the physical and chemical properties of the plasma are discussed in detail with the interpretation to be placed on the results obtained. The causes of anæmia and the nature and mode of action of hæmopoietic substances are analysed, and an ætiological classification of the anæmias is set out. In subsequent chapters the anæmias are discussed under a more clinical grouping, such as the anæmias of pregnancy and the anæmias of infancy and childhood. In all cases an account of the clinical and hæmatological picture is supplied together with a discussion of the pathology, ætiology, diagnosis, and treatment. Though an admirable description of agranulocytic angina is included in the chapter on diseases due to aplasia or hypoplasia of the bone-marrow, the authors point out that in one group of cases at least marrow hyperplasia is characteristic, suggesting that maturation arrest is the fundamental pathology of the condition. In the chapter devoted to the leukæmias modern literature dealing with mononuclear leukæmia is surveyed. This variety of leukæmia is recognised more frequently in America than in Europe. Careful study of the section dealing with hæmo-agglutination and blood transfusion should do much to lessen the fatality from unsatisfactory transfusions. Each chapter is completed by a concise summary and a bibliography. All essential technical methods are fully described in the text, and throughout the monograph knowledge is clearly summarised and presented as far as possible in tabular form. The book is well illustrated with graphs and coloured plates both of macroscopic appearances of the bone-marrow and of blood films stained presumably by Leishman's stain though no indication of the method employed nor of the degree of magnification is given. The research worker in hæmatology may regret certain rather uncritical statements; for instance, in a discussion of the value of the reticulocyte count the unqualified remark that "if a reticulocyte crisis occurs it can be assumed that the treatment will be effective." Unfortunately work which was summarised in the special article by Minot and Castle which appeared in our columns last month[1] has shown that there are many non-specific substances such as arsenic and certain protein derivations which when given to patients with pernicious anæmia may cause an output of reticulocytes but no further rise in red cells or hæmoglobin; while the exact interpretation of the response in any case depends on a careful evaluation of many variable factors which are not discussed by Whitby and Britton.

This monograph should prove of great value to students and practitioners who need a concise summary of the ever-increasing literature on hæmatology, much of which is of immediate clinical importance. They will find in this work little unnecessary theory and much practical information set out clearly and succinctly.

Radiological Atlas of Chronic Rheumatic Arthritis (Hand)

By S. GILBERT SCOTT, M.R.C.S., L.R.C.P., D.M.R. & E. Camb., Honorary Radiologist to the British Red Cross Clinic for Rheumatic Diseases, Regent's Park, and to the Charterhouse Rheumatism Clinic; Consulting Radiologist to the London Hospital. London: Humphrey Milford. Oxford University Press. 1935. Pp. 76. 30 plates. 25s.

THIS important monograph should pave the way to a better understanding and treatment of "rheumatism." Dr. Gilbert Scott makes no claim to be an authority on rheumatism, but after an exceptionally wide general experience he has in recent years studied with an open mind a wealth of clinical material passing through the British Red Cross rheumatism clinic and has drawn from this study conclusions of great practical value. All may not agree with him when he attributes the failure of workers in the past, notably Strangeways, to elucidate the problems of rheumatic conditions mainly to their unquestioning acceptance of the clinical diagnosis. There is much in his claim that the clinical diagnosis of these conditions is unreliable taken alone, and that the only accurate method of diagnosis is by the radiological examination, but most clinicians would maintain that both methods must be used together. Dr. Scott uses the hand as "the visiting card of the rheumatic patient." He classifies his cases on a radiological basis, and claims that nearly all fall under four well-defined headings. Doubtless this simple classification is open to criticism, but it serves its purpose and is, at least, a reasonable foundation. The 30 radiograms are, of course, so well reproduced as to show clearly the changes described.

Chronic Nasal Sinusitis and its Relation to Mental Disorder

By F. A. PICKWORTH, M.B., B.S. London: H. K. Lewis and Co., Ltd. 1935. Pp. 156. 16s.

THE first element in the title of this book receives much more attention than the second; it may indeed be questioned whether any essential connexion between the two follows from the evidence so laboriously collected and here so fully presented. The finding of sinusitis in patients who died in mental hospitals, often after many years of institutional life, cannot be taken as ætiologically significant in the absence of control data. Dr. Pickworth has an ingenious theory about the vascular happenings which follow on chronic nasal sinusitis and are responsible for physical changes of the brain tissue. The earlier chapters of the book are devoted to the anatomical, physiological, and pathological basis for this view; there are then three chapters dealing, respectively, with nasal sinusitis in general medicine, the pathology of mental disorder and defect, and the relation of nasal sinusitis to cerebral pathology and mental disorder. Notes of special cases and some methods of investigation are appended. The detailed observations will be critically examined both by the rhinologist and the psychiatrist. The latter may find it difficult to agree that loss of brain substance from severe and prolonged functional ischæmia leads to a spreading of ungoverned nerve impulses and so to abnormal conduct, or that hysteria should be treated as a medical disease due to minute focal brain lesions. The illustrations in the book are from original specimens and well produced.

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[1] THE LANCET, August 10th, 1935, p. 319.

The Osteopathic Lesion

By GEORGE MACDONALD, M.B., Ch.B. Edin., D.O. Kirksville, U.S.A., and W. HARGRAVE-WILSON, D.O. London: William Heinemann Ltd. 1935. Pp. 141. 7*s.* 6*d.*

THIS book is of value as a contribution to the discussion of the claims of osteopathy, which have recently aroused so much public interest, in that the authors state precisely what they believe the osteopathic lesion to be. In order to make their meaning clearer they have chosen to concentrate upon an osteopathic lesion of the joints between the fifth and sixth dorsal vertebræ; they define the lesion as an acute or chronic joint strain which leads to local, peripheral, visceral, and general effects. Particular stress is laid upon the visceral changes which are supposed to be produced by nervous impulses arising in the neighbourhood of the strained joint, passing to the spinal cord, and reaching the viscera along sympathetic efferents—the so-called somatico-visceral reflex. They claim that Mackenzie's views on the viscero-motor reflexes harmonise with osteopathic theory, though they admit that in the reflex path which he described the impulses travelled in the opposite direction. It must also be remembered that Mackenzie was able to bring forward sound evidence that a viscus is capable of providing an adequate stimulus to excite the reflex, whereas the theory that a strained joint can provide a stimulus is conjectural, the authors' suggestion being that, "because of the popularity at the present moment of physiological chemistry and hydrogen-ion concentration in medical research," the possibility that biochemical changes in and around the osteopathic lesion may be of ætiological significance cannot be dismissed. They are satisfied, however, that it would be only reasonable, even without any evidence, to assume that it is possible for a joint strain to give rise to such reflex effects in the viscera, and they go so far as to hint that the areas of tenderness over the dorsal spine described by Mackenzie in cases of gastric disease were in reality the local evidence of the osteopathic lesion to which the changes in the stomach were secondary.

Dr. Macdonald and his collaborator state that the anatomy, physiology, and all the basic sciences taught in osteopathic institutions are exactly the same as those taught in medical institutions. Though this may be so, there are certainly profound differences between these sciences as taught in the medical schools and the references to them which appear in this book. It would be difficult, for instance, to explain on physiological grounds the close relationship between the cilio-spinal centre and the centre of life, or why a sense of general well-being should depend upon the integrity of the second dorsal segment, or why the proximity of the spinal muscles to the central nervous system should account for the particularly marked tension of these muscles which is alleged to result from mental anxiety. The statement that it may well be an osteopathic lesion of the upper dorsal spine which predisposes the upper lobe of the lung to tuberculous infection is scarcely to be taken seriously when one reads in the next sentence that a large number of suspected tuberculous infections of the lungs prove on radiological examination to be nothing more than upper dorsal scoliosis.

The alleged effects of the osteopathic lesion are traced step by step from disturbances of the neighbouring organs to malfunction of the ductless glands and to reduction of the general resistance of the body to infection, and finally we are guided to the inevitable conclusion that the great possibilities of osteopathy lie in preventive medicine, though it is admitted that there are a few diseases which are sufficiently potent in themselves to cause illness even in an osteopathically sound body. Such extravagant ideas do not pervade the whole book, which is characterised rather by the modesty of the claims made by the authors for the healing power of osteopathic manipulation. They consider that this form of treatment is not suitable for cases of established disease, but that it is indicated particularly when symptoms are due merely to some disturbance of visceral function, or to neurasthenia and nervous exhaustion. It is a book which should be read by any medical man who wishes to judge for himself whether the osteopathic concept is founded on scientific fact.

Dorland's Medical Dictionary

The American Illustrated Medical Dictionary. Seventeenth edition. By W. A. NEWMAN DORLAND, M.D., F.A.C.S. With the collaboration of E. C. L. MILLER, M.D. Lond. London: W. B. Saunders Co., Ltd. 1935. Pp. 1573. 30*s.*, or with thumb index, 32*s.* 6*d.*

IT is not three years since we reviewed the sixteenth edition of this dictionary. The preface tells us that during this time a large corps of collaborators have scrutinised every page, editing the whole matter and adding several thousand new definitions. There are 80 more pages, but the bulk of the volume is certainly not greater and the price is 5*s.* less. It is hardly necessary to tell our readers about the contents of so well known a volume; its completeness is such that it is now something like a treasure hunt to find any missing words. But Dorland still knows nothing of the Higginson who invented a syringe, although we can now find Peter Chamberlen who invented the forceps; there is a convenient single word to express the belief that the world exists only in the mind of the philosophising individual and that word is not in Dorland. The second initial of the Swedish physiologist whose memory is perpetuated in the wool test is not C., the name is Frithiof. But the other minutiæ we had reserved for this occasion have been picked up in the really admirable revision. We would only ask the editors what has happened to the x of thorax in the word "thoracentesis," and whether the portrait on p. 620 is that of Wilhelm His senior or junior. The dictionary, as we have said before, is a masterpiece of legible compression.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 21, 1935

A HOSPITAL INSURANCE SYSTEM

No better start can be offered to a gathering of professional men of widely different outlook, habitat, and experience than a provocative address covering interests common to them all. During the course of his survey of hospital problems, published in last week's *British Medical Journal*, Sir JAMES BARRETT gave to well-worn themes a new orientation, and to prickly issues that firm grasp which mitigates the effect of their sting from a painful eruption to a mild titillation by no means disagreeable. It is not customary for the British Medical Association to discuss in public the president's address, but one can imagine the members congregating in small groups as they left the Melbourne Town Hall eagerly debating such questions as the source of capital and revenue of hospitals in different parts of the Empire; the optimal size of hospitals anywhere; the remuneration of the medical staff—whether in prestige and experience, or in cash; the widespread exploitation of student labour in the routine nursing of hospital patients; and the far-reaching development of contributory schemes in Victoria during the last 25 years. It was with an account of this last adventure in hospital insurance systems that Sir JAMES opened his survey, and it is not unreasonable to suppose that its success has influenced his outlook on the economics of hospital provision elsewhere.

It appears that in 1911, under the auspices of the Victoria Bush Nursing Association, one trained nurse was established after many difficulties at Beech Forest, the residents undertaking to pay her salary. In two years' time there were 13 such nurses. At first the money for their salaries was raised by local subscription, but the varying amounts contributed by residents caused trouble, and it was decided that all contributors should pay the same sum and should be entitled to nursing care at need without further charge. Next came the problem of housing the nurses, and it was found that the privacy and convenience of both nurse and patient was best assured by the renting of small cottages for this purpose. The supervision of centres great distances apart became impossible as an honorary service, and in 1913 a superintendent was appointed with the aid of the Walter and Eliza Hall trust. The movement grew until in 1921 there were 33 centres; then small cottage hospitals began to be established by generous benefactors, and to these were transferred the payments under the contributory scheme for nursing. Contributors became entitled to hospital and nursing attention for themselves and their dependants up to a certain age, at the cost of about £2 2*s*. per week over and above their annual subscriptions, making their own arrangements with their medical attendants. In 1926 the Edward Wilson trust decided to establish an ambulance service on a similar basis to the nursing association—that is, to be self-supporting after the initial gift. Now, in 1935, there are in Victoria —a State with an area of 88,000 square miles and a population of 1,800,000—69 centres maintained on a contributory basis, served by 22 ambulances; 45 of the centres are hospitals with an aggregate of 416 beds. These hospitals receive no State aid for construction or, except in six special cases, for maintenance. They must maintain themselves or close; and so far none has closed. They are staffed entirely by well-paid trained nurses, and are said by Sir JAMES BARRETT to provide the cheapest hospital accommodation in the State. He claims that a great improvement in medical practice has resulted from the provision of suitable buildings and highly trained nurses in country districts. It is noteworthy that all the doctors who treat patients in these hospitals become ex-officio members of the committee of management, and that the hospitals, in addition to their usual functions, provide centres for welfare work and for the medical inspection of school-children. The system works smoothly and efficiently.

Far less satisfactory from the financial point of view is the position of the so-called public hospitals in Victoria. These are maintained by voluntary contributions, by Government subsidy, and by patients' contributions, but are not under direct Government control, being administered by honorary committees. Up to about 1900 this arrangement is said to have worked tolerably well but since then conditions have changed. The total income from all sources has increased fourfold but has, of course, been matched by the expenditure. The number of patients desiring treatment has increased nearly fivefold, though the population of the State is only about 50 per cent. greater than it was. In 1900 the number of patients treated by public hospitals was 7·2 per cent. of the population; in 1934 it was 17·4 per cent. Sir JAMES BARRETT holds strongly that the main problem of finding and financing hospital beds in sufficient numbers arises from the fact that the sick population of every class has become more hospital-minded. It is with the future of these public hospitals that his address is largely concerned. His bias is clearly towards their maintenance as far as possible on a voluntary basis, aided by Government subsidy but managed as hitherto by honorary committees. Some of the arguments wherewith he supports his thesis may require closer examination, but they lead him to such interesting by-ways that none will reproach him for straying from the strictly logical path. Our own quarrel would be not so much with the deduction he draws from premises not always clearly stated as with any attempt to discuss such problems as the optimal size of a hospital from the purely financial aspect. This is a matter that must depend on such factors as local needs, the site available and its accessibility, and the proposed construction of the hospital.

For example, the transit of personnel and material between departments, which is one of the causes of extra expenditure in a very large hospital, is minimised if the hospital is built on a vertical rather than on a horizontal plan; and the relative cheapness of construction and maintenance of a very small hospital often implies less efficient medical service, especially in the lack of special diagnostic departments. The wide variation of standards is illustrated by the statement attributed by Sir James to the staff of a Bush nursing hospital of 30 beds, that not more than 4 per cent. of the patients require a pathologist. The primary need, however, in isolated districts is adequate clinical supervision and nursing care, and that is clearly available in the hospitals under the contributory scheme of the Victoria Bush Nursing Association. Sir James Barrett's main theme, that in all countries institutional rather than domiciliary treatment is being demanded by an increasing section of the public and will have to be supplied, is not likely to be disputed, and his exposition of a hospital insurance system so well adapted to the needs of the country it serves will command attention.

THE CARE OF THE MENTALLY DEFECTIVE

Public interest is easier to arouse in curable disease than in disorders which are apparently not amenable to treatment, and this no doubt has been one reason why mental defect has been largely left to philanthropy. Another reason for its neglect is the stigma of its supposed relation to insanity. But more and more has mental deficiency been forced on public notice as a problem in sociology by the Brock report and by the suspicion that a considerable proportion of crime is committed by those suffering from mental defect. What has not kept pace with this realisation is the effort to solve the problem. It is only slowly being grasped that much less spectacular measures than eugenic sterilisation or the intelligence testing of offenders can be undertaken by authorities which have the encouragement of informed public opinion. An important section of the Board of Control's report for 1934, a summary of which is given on p. 685, contains some record both of the activities of philanthropic bodies and of the tardy appreciation by public bodies of what can be done.

Only half the estimated probable number of defectives are notified, and of these rather less than half are in institutions. Something of the discrepancy which exists may be gauged from the fact that of the small number of criminals during 1934 who were proved to be defective almost three-quarters had not attended a special school at all, a figure closely resembling the Wood Committee's estimate that 77 per cent. of feeble-minded children are educated in ordinary elementary schools. Such a result can only arise from the fact that the provision of special schools remains too small; numbers of children who swell the overcrowded elementary school classes are incapable of profiting by the teaching provided. These facts are appreciated by education committees. But local authorities have no legal responsibility for the defective child between the ages of 14 and 16, and although this is a state of affairs that cannot last much longer, the knowledge that such a gap exists has played into the hands of authorities which shirk the care of defectives. The medical practitioner meets many situations in which a knowledge of the social implications of mental defect is of value. He is not limited to the thankless task of seeing that the unfortunate child is properly notified. Many defectives can be placed under guardianship in suitable homes, where they have a chance of doing some kind of manual wor for which they are fitted. In Scotland, wher guardianship is more generally used, the remova of defectives from home—often, alas, the environment most unsuitable for them—has had a beneficia effect. There are many cottage homes in th country which would welcome a paying guest o this kind if the medical man were to suggest it There is work to be done both for defective children and adults. Special schools offer an opportunity of teaching posts to those who are better suited for this specialised work than for more routine teaching. Medical practitioners are likely to know the kind of women who, making hard weather of ordinary teaching, might flourish teaching the educable defective. Day centres and clubs, now being opened in various places, afford scope for many who would fight shy of more obvious philanthropy. At these centres defectives who live at home, or are under guardianship, can attend and do simple but useful work. Women applying for such posts need not have had previous experience in schools, though interest in Froebel method or its equivalent is of value. The extent of all these opportunities is outlined in a pamphlet issued by the Central Association for Mental Welfare, 24, Buckingham Palace-road, London, S.W.1.

Medical influence in these matters need not be restricted to the private contact between doctor and patient. Medical officials of the public bodies can only work for reform if the elected representatives on these bodies are pressing for progress. Whether as a member of the public health committee or as a magistrate the medical man's opportunities of stimulating interest in the care of the mentally deficient are considerable. There is no obvious reason why England should lag behind Scotland in the guardianship of mental defect, or why freer use should not be made of the services offered by the Central Association or the Guardianship Society. There are bodies whose title suggests more exciting efforts, but few which are working so quietly along progressive lines.

PERSONALITY AND AGE

Personality is the product of a large number of dependent variables every one of which must be studied in relation to the independent variable, age. It is fortunate that, in this country at any rate, documentary evidence is available for determining age with scientific accuracy, fortunate since in its absence there would be little if any proof of age which would be accepted as conclusive in medical jurisprudence. For age as represented by solar time may be a very different thing from age in the biological sense. A person may be 30 years of *age* but 60 years *old* when judged by physical, physiological, or psychological criteria; and the converse is equally true. The tendency to change with advancing age is worthy of investigation. How frequently we fail to appreciate the significance of tendencies is illustrated by the many attempts to elicit the secret of longevity from the behaviour of an individual centenarian. The statements of the celebrated Brighton twins may be recalled. One attributed his health and longevity to his being a non-smoker and a total abstainer; the other was equally confident that his condition resulted from his lifelong generous indulgence in both alcohol and tobacco. Such was the leit-motif of the presidential address given by Mr. LL. WYNN-JONES, Ph.D., to the psychological section of the British Association at Norwich. He is careful to point out the difficulty of distinguishing between the senile and the pathological. A person who is as mentally alert at 90 as he was at 50 would be abnormal, but certainly not pathological. If he showed the mental deterioration customary to age it should more properly be regarded as a senile than a pathological change. In the individual personality there may be both pathological and senile changes which cause a deterioration of function long before the total personality has attained its maximum development and physiological perfection. There are functions which improve with age at least to middle life, which is admittedly a question-begging qualification; others which deteriorate with age; and still others which are largely independent of age. Dr. WYNN-JONES refers to the plebiscite invited in Germany a few years ago to enumerate the subjective sensations of becoming old. Analyses of the reports showed that the average age was 49, but individual variations were very wide, indeed from 18 to 82. As might have been expected, some laid greater stress on bodily than on mental signs; others did precisely the opposite.

In his "Adult Learning" (1928) E. L. THORNDIKE published a study of the changes in the ability to learn from age 15 to age 45. He concluded that nobody under 45 should restrain himself from trying to learn anything because of a belief that he is too old to learn. "If he fails in learning it, inability directly due to age will very rarely if ever be the reason." The reason is more commonly a constitutional inferiority to learn that particular thing or the lack of a sufficiently strong desire to encourage adequate application. THORNDIKE's conclusions are naturally important in respect to schemes for adult education. On the average, visual acuity, which is probably the first physiological function to deteriorate with age, becomes at 50 sufficiently serious to handicap the individual in occupations where visual requirements are exacting. But in a test of reaction speed the average man of 80 is only 50 per cent. slower than the average man in his prime, and even the latter is less speedy than some men of 80. Industrial accidents decrease with increasing age from the greater experience and caution of the older workers. As a contrast, pedestrian accidents are far greater over 65. This of course is only to be expected when one considers the disadvantageous circumstances which come into play—increase in weight, decrease in agility and speed, impairment of sensory acuity, and a variety of senile effects on mentality. W. R. MILES has pointed out[1] that intellectual abilities, as measured by tests of memory and of intelligence, show a relatively small deterioration: and since differences between individuals at the older ages are often quite marked, other factors are probably more weighty than age. Prof. CHARLOTTE BÜHLER[2] singled out the importance of age in athleticism, utilising the records of 1930 as criteria of maximal motor abilities. It appeared that activities which demanded a maximum of expenditure of energy were best demonstrated by the youngest—e.g., the champion sprinter's age was 23·5 years. When greater economy of effort and demands of technique came into coöperation, the age of the champions became progressively older—e.g., the distance runner, 25·6 years; the tennis player 28·5 years; the polo player up to 50.

Dr. WYNN-JONES, in referring to Prof. BÜHLER's conclusions, has extended the analysis to two typical British sports, cricket and golf. He observes that when the highest standard is demanded—batsmen who have exceeded three thousand runs in a season—the median age is 34·5 years, and that in golf the 37 open champions since 1894 showed a median age of 31 years, the extremes being 23 and 44. Dr. ADOLPHE ABRAHAMS has published some observations which bear upon this aspect of age in athletics. The tendency, he believes, is to accept too readily as inevitable a reduction of activity through increasing age. He has supplied examples of athletic improvement long past the time when it is generally looked for, and he attributes such improvement to increasing experience: not merely the acquisition of technique or of judgment in employing the physical resources to the best advantage, but a sort of individual cell education automatically acquired as the result of continued training and automatically utilised. Dr. WYNN-JONES concludes with the reminder that not only during childhood and adolescence, but throughout the life span, age as one of the primordial potencies should be studied more systematically. The relative importance of the various traits at different stages of life has a bearing upon such vital problems as the school-leaving age, the age allowance for scholarship candidates for the universities, and the necessity to ascertain in industry how far the handicaps of the older workers are due to their own physiological, mental, or vocational disabilities and how far to the age prejudice of employers.

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[1] Stanford Later Maturity Publications, 1931, 2, 3.

[2] Der Menschliche Lebenslauf als Psychologisches Problem, 1933.

ANNOTATIONS

PLEURAL AND PULMONARY SEPSIS

IN his Lettsomian lectures to the Medical Society of London, which have now been published in the transactions, Mr. J. E. H. Roberts covers the whole field of the surgery of pleural and pulmonary infections. The general reader will perhaps be most interested in the sections which deal with the septic infections of the lungs and pleura—bronchiectasis, pulmonary abscess, and empyema—for these are emergencies of medical practice which concern the general practitioner at least as closely as they do the workers in special departments. The adequate treatment of bronchiectasis, as Mr. Roberts rightly insists, demands the collaboration of physician and surgeon. The patient depends upon the former for diagnosis at a stage when surgery can still offer a hope of cure. It is no longer necessary to wait until gushes of stinking sputum at stated hours, clubbed fingers, and physical signs of expectoration bring melancholy proof of incurable disease. The injection of lipiodol as a preliminary to X ray examination of the bronchial tree is seldom necessary in such cases and may indeed be undesirable. But in the exploration of lungs damaged by pneumonia, in the investigation of obscure cases of chronic cough or hæmoptysis, lipiodol will often clarify the clinical picture and point the way to relief. In the same field diagnostic bronchoscopy has made notable advances. Early diagnosis in this disease as in most diseases implies the possibility of cure. Here lobectomy has achieved its most notable triumphs. The experience of Mr. Roberts enables him to support the teaching that this hazardous operation is less dangerous in early life than it is at a later age. As youthful sufferers from infected bronchiectasis, one of the most loathsome of all diseases, have hitherto been condemned to early death, it seems likely that this operation will be more frequently undertaken. The operative mortality, estimated at under 10 per cent., is a slight risk compared with that of the untreated disease. For the relief of patients whom surgery cannot help the system of postural drainage, advocated by Mr. H. P. Nelson, based upon the anatomy of the bronchial tree will be found far more efficient than the traditional bedside tipping and the creosote chamber, which was at best a clumsy and relatively ineffective method of inducing cough and expectoration.

In the treatment of empyema a tendency to postpone or to endeavour to avoid operation has been noticed since the discovery of the heavy death-rate among influenza patients suffering from watery empyemata and submitted to early operation. The finding of pus in the pleural cavity is no longer regarded as an indication for an emergency operation. Patients are now sometimes left soaking in their own pus for days until a series of test-tubes indicate that safety has at last been attained and the pleura may be opened without the risk of mediastinal flutter or other imagined evils. But whether pus in the pleura is of syn-pneumonic or meta-pneumonic origin, whether we have to deal with an empyema involving the whole pleural space or a pleural abscess limited by adhesions, the principles of treatment remain the same. It is only their application that must be altered. Pus must be removed and the sooner it is removed the better; the cavity must be obliterated, and any delay in its closure may result in a chronic empyema; the function of the underlying lung must be restored, and the earlier it is restored the more complete will be its restitution. Repeated aspirations are seldom curative and they are disturbing to the patient; they diminish but do not abolish toxæmia. Mr. Roberts advocates a single aspiration as a preliminary measure when the mediastinum is mobile, but for subsequent drainage he recommends an intercostal catheter and closed drainage system. There is general agreement that a closed drainage system, preferably with some form of suction, should be used whenever an empyema in the acute or early chronic stage is treated by thoracotomy and rib resection. The considerable number of cases of chronic empyema still encountered proves that the early treatment of empyema is often imperfect. Yet the principles upon which treatment should be founded are easy to understand, the technique of their application is simple, and the results of such treatment entirely satisfactory. It is neither to the credit of medicine nor surgery that two thousand years after the death of Hippocrates the treatment of empyema should so often be undertaken in ignorance and conducted in a perfunctory manner for which the patient has to pay, often in years of suffering and not seldom in permanent invalidity.

ACCIDENTS AND THE MORTALITY OF YOUNG ADULTS

A CURIOUS feature has been observed in German and French life tables which is absent from the corresponding English tables: the probability of dying in early adult male life (between ages 20 and 30) does not rise steadily with age but for a few years of life shows a slight decline. For instance, in Germany, in 1924–26, the mortality figure at age 22 was 457 per 100,000, while at age 29 it was only 404; the corresponding figures for England and Wales, in 1920–22, were 374 and 418. In the English figures there is an unbroken rise with advancing age, in the German ones a temporary improvement in the mortality experience, an improvement which is also absent in Germany and France from the female experience. This improvement amongst the males was attributed by Otto von Schjerning, in his book, "Sanitätsstatistische Betrachtungen über Volk und Heer" (1910), to the favourable influence of compulsory military service, an advantage which young adult Englishmen do not enjoy. The validity of this explanation is somewhat shaken by the results of an excellent statistical study published by W. J. Martin in the current number of the *Journal of Hygiene*. In life tables constructed on the census population of England and Wales in 1931 and the deaths registered in 1930–32, he finds that a similar course of mortality has now appeared in this country. As conscription cannot be invoked as an explanation he turns to the different causes of death in search of the responsible factor. The only two found to exhibit a decline in the mortality-rates between the ages of 24 and 27 are tuberculosis and accidents. The greater decline with age is shown by accidents, which have become proportionately much more important as a cause of death between 1920 and 1932; tuberculosis, on the other hand, has become proportionately less important. The new indentation in the English mortality curve for males is clearly derived from accidents, and excluding them the mortality curves rises steadily with age. The mortality of females from accidents follows much the same course, but with them such causes of death form in young adult life only about 5 per cent. of the deaths from all causes, whereas for males they accounted in 1930–32 for 20 per cent. of the total mortality at ages 19–23. With females, therefore, the contribution of accidents is not sufficient to change the general trend of mortality with age; with males it is amply sufficient. Subdivision of accidents into type shows that the mortality from every type except road transport is, at ages 20–25, at a lower level in 1930–32 than in 1920–22. Road accidents have increased at these ages by 450 per cent. in ten years, and accounted for more deaths in 1930–32 than did all forms of accidents in 1920–22.

THE RADIUM BEAM

ON another page Mr. Stanford Cade and Mr. F. M. Allchin describe the combined treatment of hypopharyngeal cancer with X rays and radium, suggesting that such combined treatment of extrinsic laryngeal cancer by irradiation with different wave-lengths may increase the radio-sensitivity of the tumour and so lead to retrogression of the disease. This treatment they claim is safe as compared with more intensive methods. The quantity of radium used was two grammes at a distance of 6–7 cm. from the skin, each patient receiving two treatments of 50 minutes each in the twenty-four hours, five days a week for six or seven weeks. The authors think that two grammes of radium may not be the best possible quantity for this purpose and state their intention of increasing the quantity as opportunity arises. It is announced that a new "bomb" containing four grammes of radium is to be assembled and tested in the workshop of the Westminster Hospital radium annexe at Hampstead. In this bomb the hollow globe will probably consist of a new tungsten alloy one and a half times the density of lead, with a gold or platinum collar at the outlet, by means of which the gamma rays will be more effectively prevented from spreading, the size of the bomb remaining unchanged. With the new apparatus radium beam treatment will be applied at a greater skin distance with the result that a more effective dose can be given at a greater depth below the surface. Minor improvements in the suspension of the bomb will avoid the necessity of adjusting the distance of the radium from the patient by raising or lowering the radium container. The present two-gramme bomb is at present continuously in use at the annexe for five days a week with three shifts of operators, two days of the week-end being reserved for experimental work. It will be a satisfaction to all concerned when the new building in Horseferry-road, with its ample allotment of space for radium and cancer work, will bring this work again into close relation with the clinical activities of Westminster Hospital.

TOXIC ACTION OF VOLATILE SOLVENTS

IN recent years the industrial use of volatile solvents has increased, especially in the processes involved in cellulose spraying, in the rubber and artificial silk industries, and in the dry cleaning of clothes. It has long been known that inhalation of the vapour of many of these may have serious toxic effects. Thus chronic benzol poisoning is characterised by progressive anæmia with leucopenia and hæmorrhages; many of the chlorinated hydrocarbons of the aliphatic series produce severe and often fatal hepatic and renal damage. Inhaled in high concentration these vapours produce general anæsthesia, often with convulsions and other toxic effects on the higher centres. Dr. L. Dautrebande[1] has directed his attention to a different type of action, namely, that on the blood-vessels, the solvents investigated being benzol, petroleum ether (the lower boiling fractions present in petrol), and amyl acetate. After one minute's inhalation by dogs of air loaded with either benzol or petroleum ether there is not only a fall in blood pressure, but the occlusion of the carotid sinuses which normally gives a large rise in pressure is now without effect. Amyl acetate has no such action at ordinary temperatures, but if the inspired air is warmed to above 28° C. the same phenomena are observed. The normal response to carotid sinus occlusion returns about two minutes after withdrawal of the vapour. By studying the effect of inhalation of these substances before and after the administration of a number of drugs acting on different points of the vasomotor system, it is concluded that their action is due to a direct effect on the walls of the blood-vessels. This view is confirmed by the fact that all three solvents have a direct paralysing effect on isolated smooth muscle. Thus it is shown that saturated solutions inhibit the contractions of the frog's heart, the rabbit's intestine, the pig's ureter, and the virgin rabbit's uterus. Evidence is also adduced to show that benzol and petroleum ether when inhaled have a direct toxic effect on the heart; in fact, if benzol and adrenaline are administered simultaneously, death often results from ventricular fibrillation, benzol in this respect resembling chloroform. Dautrebande considers his results of significance for industrial toxicology, and it will certainly be of interest to see if similar phenomena can be detected in man now that attention has been drawn to them. The vasomotor paralysis may well explain the syncope which occurs in acute poisoning with these substances. It is unlikely, however, that these effects are related in any way to the serious damage to the hæmopoietic system which occurs in chronic benzol and petroleum poisoning.

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[1] Presse méd., July 6th, 1935, p. 1051.

PRACTICAL LESSONS FROM IRRADIATION OF BODO CAUDATUS

THE effect of gamma ray irradiation upon the growth of the protozoon *Bodo caudatus* has been the subject of prolonged and careful study over a considerable period by Miss Muriel Robertson, D.Sc., and her collaborators at the Lister Institute, and in two recent publications the results obtained have been summarised.[1 2] It is the non-necrotic effects of gamma rays in restraining growth that have been studied. The organisms were not killed by the amount of radium used; their food-supply was unaffected by the irradiation and the reactions in regard to rates of growth of the successive generations of cells, their size and physiological reactions could be studied in comparison with those of controls under normal conditions.

It was found that the cells of less than a certain age at the moment of exposure were greatly delayed in entering into division, so that the increase in numbers could be restrained till it equalled only 20 to 30 per cent. of the normal growth. This extreme restraint of the multiplication was an expression of the reaction of sensitive cells exposed for the first time in their cycle of growth from their emergence at division of the parent to their maturity or moment of ripeness for division. Upon further prolongation of the irradiation the growing cultures showed a recovery in rate of multiplication and the subsequent passage through this cycle (that is the production of the second and later generations) in the presence of the radium occupied a lesser time than the first. Expressed in hours, it was shown that irradiations of two hours and less were of little effect, exposures of 4 to 8 hours produced the greatest actual check in the multiplication, while those lasting for periods of from 10 to 22 hours which last was the limit of the experiments, showed growth varying only within narrow limits and averaging about 60 per cent. of the normal computed over the whole period. There was no further summation of effect with the increasing duration of the exposure after the tenth hour, which coincided with the evolution of the second generation produced during the irradiation. The evolution of the cultures in the presence of the radium was characterised by an enhanced size in the irradiated cells in comparison with the normal. The physiological reaction to the radium which was correlated with this larger size has been studied by Lawrie and Robertson.[1] They found that the very short irradiations of 2 to 3 hours were marked by a reduction in the nitrogen metabolism of the irradiated cells as judged by the production of ammonia; after about 3 to 4 hours on the radium plaque the ratio between the normal and irradiated in this respect lay either slightly below or approached unity. From 5 hours' however to somewhere about 9 hours' exposure the nitrogen metabolism as expressed per bodo was definitely greater, actually increasing to about double that of the normal; the ratio finally settling for irradiations of longer duration (10 to 22 hours) at about 42 per cent. above the normal. Upon removal from the radium, an effectively irradiated culture of *Bodo caudatus* after a period of time begins to accelerate in the rate of multiplication above the normal until if sufficient time is allowed the numbers of cells on the released plate comes to equal those in the normal control. During this compensatory process the enhanced size produced by growth in the presence of radium returned to the normal. There was no radium fastness and re-irradiations were always effective in some degree. The cells having approached the normal again had to be reconditioned if they were exposed again and went through the check in rate and rise in size as in a first exposure. In so far as they had not returned to the normal during the released period the power to evince the rise in rate of increase which was now imminent was held in check by the re-exposure, the multiplication was kept at the uncompensated level, or was further depressed.

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[1] Lawrie, N. R., and Robertson, M.: Biochem. Jour., 1935, xxix., 1017.

[2] Robertson, M.: Brit. Jour. Radiol., 1935, viii., 502 and 570.

These results may well have a practical application in therapeutic irradiation, but from the medical standpoint they are minimal effects, since no necrosis was induced and there was no change in the value of the ample food-supply. The occurrence of a particularly sensitive period in the life of the growing cell seems once again to have been demonstrated, and the importance of considering the growth of cells in relation to the succession of generations emerges clearly. Thus a single effective irradiation appears to be one that lasts over rather more than one normal generation time of the growing cells. Exposures of less than 2/5 of the generation time were practically speaking ineffective. The cells of the second generation produced during a continuous exposure show definite recovery in the rate of multiplication in these non-necrotic irradiations, but they are forced into a larger size and show a higher nitrogen metabolism. Under the conditions of the practical irradiation of tumours the cells might, without necrotic changes actually being produced, be rendered unable to respond to the exacting physiological demands of growth in the presence of radium. It must also be added that tissue cells, being more sensitive than protozoa, are liable also to irreversible injuries which do not come into consideration in these studies. The absence of further summation of effect with increase in the duration of the exposure beyond that achieved at the end of the second generation of cells in continuous irradiation is a point of practical importance. Taken in conjunction with the interesting fact that after a fully effective irradiation it requires the period of one to one and a half generations of growth after the removal of the radium before the compensatory acceleration of growth sets in in these uninjured organisms, it shows that long intermissions in exposure may be inserted without loss of total effect. This was tested experimentally and the effect of properly spaced interrupted irradiations was found to lie within the limits of continuous irradiations over the whole experimental period of four to four and a half generations (22 hours). As further points of practical interest it may be noted that there is no evidence of any primary stimulation of growth in these non-necrotic irradiations. There is also no sign of radium fastness in the sense of acquired resistance or insensitiveness due to previous exposure. The organisms which showed temporary adaptation to radium by the recovery of their rate of multiplication in the second and subsequent generations of growth in a continuous exposure returned to normal upon the elapse of from 1·7 to 3 generations of growth in the absence of radium, and were then exactly as sensitive as on the first occasion. The adaptation was a purely physiological one made appreciable by the enhanced size and raised metabolism which seemed to be the necessary condition of growth in the presence of gamma irradiation. It is again noticeable here that the cultures were more sensitive to the effects of irradiation in periods of rapid growth and oxygen uptake than in periods of lesser activity in these respects.

A FRENCH SANATORIUM VILLAGE

AT the end of the war France was faced with a serious deficiency in sanatorium accommodation for middle-class patients. A depreciated currency made treatment in Switzerland possible only for the wealthy and the French Alps did not at that time provide an adequate substitute. To meet this deficiency the "Association philanthropique des villages-sanatoriums de haute altitude" was formed and a suitable site for development was selected at Passy, a sunny sheltered plateau about 4000 feet above sea-level and not many miles distant from the Mont Blanc range. Eight sanatoriums have now been built in this neighbourhood containing in all 1200 beds. A thoracic surgeon from Paris pays regular visits so that operations when required can be carried out without breaking the continuity of sanatorium treatment which is so well organised by Dr. F. Tobé. The bulletin[1] recently produced by the group of Passy doctors, intended as the first of a series, describes the health resort and its amenities, with a number of short clinical papers illustrating problems of treatment. Among these is a paper by Dr. J. Rolland and Dr. A. Maurer on pulmonary complications consecutive to thoracoplasty. Thirty-six post-operative complications occurred in 169 cases and sixteen of these ended fatally. Basal congestion was found to be more frequent after phrenic evulsion, and the authors deprecate routine paralysis of the diaphragm on the affected side. As might be expected, complications were relatively few among patients who had lost their fever and toxæmia during a preliminary period of sanatorium treatment. Those with a large amount of sputum, and in particular those showing a fluid level in a cavity, were especially prone to post-operative pulmonary complications. Full use is being made at Passy of the exceptional facilities for the clinical study of tuberculosis, and further bulletins will be awaited with interest.

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[1] Bulletin et mémoires de la société médicale de Passy Haute Savoie), No. 1, December, 1932–December, 1934.

REBUILDING PROGRAMME

THOUGH local conditions provide the text for the argument in a stimulating study[1] of the housing question in Manchester Sir Ernest Simon is better qualified than most people to write on housing problems in general, and much of what he says deserves a wider application. Beginning with a glance at the terrible story of laissez-faire in the housing of the lower paid workers, he and his collaborator set out the achievements of the city council in reconditioning, in building new houses, and in town-planning. One of the most important parts of the book is the section, to which Lady Simon contributes, on Wythenshawe, the first complete garden city planned as a satellite by a local authority. All the difficulties, parliamentary as well as local, which have delayed the development of Wythenshawe are described in detail and quite impartially. The conclusion stands out that a big local authority is very well placed to foster the garden city movement, because it can supply both cheap capital for development and houses in large numbers to make the capital remunerative. The absence of these two factors has done much to retard the successful growth of Welwyn and Letchworth. It is perhaps going rather far to say that the garden city movement can only succeed if it is sponsored by our great cities, but it is highly probable in view of the success of the Wythenshawe experiment that this is the line which garden city development will generally follow. The story of Wythenshawe illustrates two conditions which are vital to success in an enterprise of this kind: (1) the mother city must own the land, and (2) it must also be the local authority for the satellite. To state these two conditions is to indicate some of the difficulties to be overcome, but it is to be hoped that even now many progressive local authorities are laying plans to follow the example of Manchester.

In discussing the future Simon and Inman emphasise the need for a long range plan, and give reasons for the view that factors of population, transport, and trade are likely to be more stable and therefore more amenable to plan during the coming than during the past 100 years. The relative merits and costs of cottages and flats are compared, the former being favoured. In conclusion, a time plan is suggested, stretching over a century, of which 50 years are allotted to the building of 20,000 additional houses and to the replacement of the whole of the existing slums in Manchester, and 50 years thereafter to the rebuilding of the business centre. The cost of the first 50 years' programme, including a second satellite garden city, is estimated at £50,000,000, apart from Government subsidies, and in this connexion it is noteworthy that during the fourteen years, ending 1934, the expenditure of the housing department has been on an average £1,000,000 a year, precisely the figure estimated for the future.

The problems of replanning a built-up area are different from and more complex than those of creating a new garden city on an agricultural site. Here also if the slums are to be rebuilt the city council must do it. An incidental result will be the transfer to the municipality of the freehold of most of its area. It is significant of the change of public opinion on housing that these far-reaching proposals should be made.

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[1] The Rebuilding of Manchester. By Sir E. D. Simon, M.A., chairman of the Manchester Housing Committee, 1912–23, and J. Inman, B.A. London: Longmans Green and Co., Ltd. 1935. Pp. 173. 5s.

TREATMENT OF SYPHILIS DURING PREGNANCY

CONGENITAL syphilis may be an irreparable tragedy for the victim, and the fact that syphilis in the new-born living child is readily amenable to early treatment is no excuse for allowing women to go through a full-term pregnancy after several miscarriages, only to be faced ultimately with a florid syphilitic offspring. In an admirable survey of 2150 pregnancies in coloured women whose Wassermann reaction was positive, carried out over a period of 17 years, J. R. McCord,[1] of Atlanta, Georgia, shows that timely treatment of the mother assures her of a syphilis-free baby in 95 per cent. of cases. What he rightly calls "disastrous pregnancies" can in fact be reduced from 49·4 per cent. in the untreated to 5·4 per cent. in the treated by insistence on a routine Wassermann reaction early in pregnancy, followed by a combined arsenical and mercurial course. Dr. McCord bases his treatment entirely on the prevention of disease in the baby. "We make no effort," he says, "to cure the disease in the mother." But while those in this country who have had similar opportunities will agree with him that it is desirable for pregnant women to have a Wassermann reaction done at least once during pregnancy, preferably early enough to ensure six months' treatment before the birth of the child, they will not agree with McCord's principle that antepartum therapy should be based only on the prevention of the disease in the child, not on its eradication in the mother. His criterion of sufficient treatment designed to this end is 10 injections or more once a week of 0·45 gramme N.A.B. combined with a heavy metal (mercury or bismuth), and he recommends the continuance of the treatment irrespective of its effects on the mother's Wassermann reaction. There is in fact little danger in submitting pregnant women to rigorous antisyphilitic treatment extending over more than twice the period suggested. By this means it would be possible almost to guarantee the birth of a healthy child as far as freedom from syphilis is concerned, and the mother would herself be receiving curative rather than merely palliative treatment.

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[1] Jour. Amer. Med. Assoc., 1935, cv., 89.

AN ANGLO-SCANDINAVIAN PILGRIMAGE.—The Viking Society, of which Mr. A. Rugg-Gunn, F.R.C.S., is president for the third successive year, is organising a celebration at Shaftesbury on Oct. 5th in honour of the ninth centenary of Canute the Great. The meeting will be attended by several Scandinavian ambassadors or their representatives, and, it is expected, by the Earl of Shaftesbury, Lord Lieutenant of Dorset. The programme includes an Anglo-Scandinavian religious service in the Abbey ruins, a reception by the Mayor, luncheon, lecture, ramble around the historic city, and tea. The inclusive cost of the pilgrimage is one guinea per head, and any medical man or woman is welcome to join it. Application for tickets should be made to Mr. A. W. Johnston, 30, Goblin's Green, Welwyn Garden City.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXIX.—PROGNOSIS IN JEJUNAL ULCER

JEJUNAL ulcer is used as a comprehensive term to include ulceration occurring in the jejunum, around the margin of the stoma and in the duodenum following gastro-duodenostomy. The prognosis is much the same in all although it has been stated that the purely jejunal ulcer has a slightly greater tendency to perforation while the marginal ulcer is more prone to develop adhesions with secondary involvement of the transverse colon.

A review of the literature does not reveal any reference to the prognosis but results of treatment are given on the medical side by A. F. Hurst and M. J. Stewart (THE LANCET, 1928, ii., 742), and on the surgical side by A. J. Walton (Brit. Jour. Surg., 1934, xxii., 33) and Garnett Wright (Ibid., 1934, xxii., 433). Hurst claims that quite a large proportion of cases can be cured by medical means provided the patient adheres closely to a prescribed régime. His figures are set out in Table I.

TABLE I.—(*Hurst*)

Cases in New Lodge series	35
,, treated medically	25
,, with satisfactory result	13

Walton and Garnett Wright on the other hand regard the results of medical treatment as most unsatisfactory, practically all cases coming to operation sooner or later. They agree that these cases offer some of the biggest and most difficult problems in the realms of surgery and that the results are by no means brilliant. For brevity I have reproduced Garnett Wright's final table of results in Table II., and given A. J. Walton's results in Table III.

TABLE II.—*Results of Operative Treatment* (*Garnett Wright, 456 cases*)

Good	150	Later results unknown		130
Fair	29	Died as result of	operation	91
Symptoms still present	44		disease ..	12

TABLE III.—*Immediate Results of Operative Treatment* (*Walton, 79 cases*)

Cases	79
Operation of partial gastrectomy	61
Deaths	16

In a personal communication Sir James Walton tells me that the later results of partial gastrectomy in his series have not yet been published, so that from his figures one is unable to assess the true value of this particular operation. Tables II. and III. show a high operative mortality, although it must be pointed out that in the last 20 of Walton's series only one death occurred. After deducting the untraced cases, Table II. shows a percentage of 51·8 per cent. as cured, while Table III. gives 57 per cent. as the proportion of partial gastrectomies successful as far as immediate results are concerned. Neither Walton nor Garnett Wright is in favour of small local operations because of the extreme liability to recurrence of ulceration; both recommend the bigger operation, namely, partial gastrectomy, provided the patient's general health is thought good enough to stand the strain.

RUTHIN CASTLE CASES

For the purpose of this paper I have collected and followed up 30 cases of jejunal ulcer admitted to Ruthin Castle. All have been traced up to the present time. The mode of treatment, whether medical or surgical, was decided after full consideration of the clinical and radiological data in each case. Cases showing an uncomplicated ulcer without marked mechanical defects of the stoma or loops (as shown by X rays) were treated by medical measures in the first instance, but if the immediate response was poor or the patient relapsed soon after a complete and thorough course, operation was advised. Of the 30 cases, 14 were treated by medical means alone; a further 8 relapsed after medical treatment and were operated upon. The results in these two groups are shown in Tables IV. and V.

TABLE IV.—*Results of Medical Treatment* (14 *cases*)

Cases cured	9
,, improved	1
Still complaining of symptoms	2
Dead	2

The 9 cases labelled "cured" have remained well for periods ranging from 4 to 10 years. The two deaths were due to sudden large hæmorrhages. In one this occurred twelve months after treatment and the patient had complained of no symptoms whatsoever. In the other intermittent mild indigestion had continued in spite of careful after-care.

TABLE V.—*Operation and Result after Medical Treatment had Failed*

Case.	Operation.	Result.
1.	Gastro-duodenostomy	Good.
2.	,, ,, ...	Patient dead.
3.	,, ,, ...	Poor.
4.	Local operation and then partial gastrectomy	Good.
5.	Do. do. ..	Patient Dead.
6.	Two local operations	Good.
7.	,, ,, ,, ...	Good.
8.	,, ,, ,, ...	Poor.

In this group five cases had to be operated on twice, showing the poor and uncertain results of local operations, which tends to confirm what Walton and Garnett Wright had found in their series.

The remaining 8 out of the 30 were immediately subjected to operation, the clinical and radiological findings being such that medical treatment was contra-indicated. These findings were: (1) gastro-colic fistula; (2) obstruction due to inflammatory thickening around the ulcer; (3) probable involvement of the transverse colon as shown by lower abdominal pain and distension or by radiological signs of adhesions to, and irritation of, the large bowel close to the site of the ulcer; (4) repeated serious hæmorrhage; (5) failure to respond to medical treatment before admission; (6) marked mechanical deformities of stoma or loops as shown by radiological examination.

In this group there were 3 cases of gastrocolic fistula and all died immediately after operation; 2 cases ultimately had 4 operations each, both being finally subjected to partial gastrectomy; one did well and the other died as a result of the operation. Of the remaining 3 cases, one has had two local operations and is now fairly well; the second has had three local operations and is now doing well, while the third had an immediate partial gastrectomy and has remained well for four years.

To sum up—17 cases, that is, rather more than half, have done well and there were 9 deaths in the series. The results of medical treatment compare quite favourably with those of surgery, although it must be remembered that only the unresponsive and complicated cases were submitted to operation. It is clear that chosen cases of jejunal ulcer can be cured by medical means, and this is in agreement with the findings published by Hurst. Also the analysis of our cases goes to confirm Walton's and Wright's contention that local operations prove unsatisfactory and that partial gastrectomy offers the best cure if surgical interference is inevitable, even though the mortality of this operation is high.

The study of this series has brought out certain other factors which may have a bearing on the prognosis. The average age on admission was 46; 9 patients were 40 years old or under, and of these 2 had four operations each and 6 had two operations each; while of the 9 patients who did well medically, 7 were over 55 and there was only 1 under 40. If any conclusion as to the effect of age on prognosis can fairly be drawn from so small a series, it is that jejunal ulcer is more serious and harder to cure in patients under 40 years of age, while those over 55 tend to do well with medical treatment provided there are no complications.

The fractional test-meal findings are also interesting. This test was done on 21 out of the 30 cases. Superacidity was present in 15; normal acidity in 2 and subacidity in 4. Of those with superacidity 8 were treated medically and 7 did well; 7 were treated surgically and 4 did well. Thus superacidity is frequently found in this disease, but this in itself does not seem to affect the ultimate prognosis. However, it confirms the common-sense view that careful dieting and alkalis should be continued indefinitely, bringing this aspect of the disease into line with the accepted principles of treatment in duodenal ulcer. The importance of this after-care has been emphasised repeatedly by the doctors who have written about the patients' present condition, it being frequently stated that the maintenance of a good régime usually means health, while the reverse leads to recurrence of symptoms and chronic ill-health.

Finally temperament, economic position, and mode of living have more than a little influence. The phlegmatic individual whose circumstances of life are such as to be able to avoid much worry is more likely to do well. It is instructive to note that 5 out of the 30 cases occurred in doctors who are prone to irregular hours, hurried meals, scanty holidays, and often an anxious existence.

Complications.—In our series the most dangerous complications were: (1) gastrocolic fistula, 3 patients, all of whom died; (2) perforation into abdominal cavity, 3 patients, 1 died and 2 still have disabling symptoms; (3) repeated severe hæmorrhage, 10 patients, 4 of whom died; (4) obstruction with cyclical vomiting, 2 patients; (5) persistent pain which led to morphia addiction, 3 patients.

CONCLUSIONS

(1) Jejunal ulcer must be regarded as a grave complication of gastroenterostomy.

(2) Patients must be considered individually as to whether the primary treatment should be medical or surgical, and medical treatment should be given a trial in all uncomplicated cases.

(3) Of surgical procedures partial gastrectomy seems to be the most useful.

(4) In all cases after-care plays an important part.

(5) The most serious complications are gastrocolic fistula, perforation, and repeated hæmorrhages.

R. P. Picton Davies, M.D., M.R.C.P.,
Physician, Ruthin Castle, North Wales.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. A. Craig to *Victory* for Haslar Hospital, and J. H. B. Crosbie to *Victory* for R.M. Infirmary, Portsmouth.

Surg. Lt.-Comdrs. E. C. Davis, A. L. McDonnell, and S. G. Weldon to be Surg. Comdrs.

Surg. Lt.-Comdrs. E. H. Rampling, J. G. Holmes, E. R. Sorley, W. P. E. McIntyre, E. T. S. Rudd, E. E. Malone, T. F. Crean, J. M. Sloane, and C. B. Fox to *President* for course.

J. Carlton, J. M. Fitzpatrick, A. E. Ginn, G. S. Grist, N. S. Hepburn, F. G. Lamb, J. Lees, D. Shute, H. G. Silvester, D. Simpson, J. L. S. Steele-Perkins, and W. F. Viret entered as Surg. Lts. for short service and appointed to *Victory* for R.N. Hospital, Haslar, for course of instruction.

Act. Surg. Lts. (D) to be Surg. Lts. (D): F. L. Ferris, A. C. Horne, and K. E. J. Fletcher.

ROYAL AUSTRALIAN NAVY

Surg. Lt.-Comdr. J. M. Flattery promoted to Surg.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. H. Winstanley to *Effingham*.

Surg. Lt. D. W. Bawtree to be Surg. Lt.-Comdr.

Proby. Surg. Lts. W. G. Gill and H. G. Rees to *Victory* for Haslar Hospital.

ROYAL ARMY MEDICAL CORPS

REGULAR ARMY RESERVE OF OFFICERS

Lt.-Col. G. W. G. Hughes, D.S.O., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

ARMY DENTAL CORPS

Lt. (on prob.) W. F. Finlayson is restd. to the estabt.

Lt. (on prob.) N. T. McNie is confirmed in his rank.

TERRITORIAL ARMY

Capt. T. A. S. Samuel, M.C., to be Maj.

Lt. R. J. C. Hamilton to be Capt.

ROYAL AIR FORCE

Flight Lts. L. S. Everett to R.A.F. Station, Ismailia, and J. Magner to No. 1 School of Technical Training (Apprentices), Halton.

Flying Offrs. P. A. Cooper to Central Flying School, Upavon; L. E. A. Dearberg and R. C. H. Tripp to Princess Mary's R.A.F. Hospital, Halton.

Fellowship of Medicine and Post-Graduate Medical Association.—The following courses will take place on the undermentioned dates: chest diseases at the Brompton Hospital (Sept. 23rd to 28th, all day); dermatology at St. John's Hospital (Sept. 30th to Oct. 31st, afternoons); proctology at the Gordon Hospital (Sept. 30th to Oct. 5th); cardiology at the National Hospital for Diseases of the Heart (Oct. 7th to 18th, all day); medicine and surgery at the Metropolitan Hospital (Oct. 7th to 19th, all day); anatomy and physiology at the Infants Hospital (Oct. 7th to Nov. 29th, Monday, Wednesday, and Friday evenings). Special concentrated week-end courses will also be given as follows: ophthalmology at the Royal Westminster Ophthalmic Hospital (Sept. 28th and 29th); fevers at the Park Hospital (Oct. 5th and 6th); heart and lung diseases at the Royal Chest Hospital (Oct. 12th and 13th); obstetrics at the City of London Maternity Hospital (Oct. 19th and 20th). There will also be lectures on X ray interpretation at the Medical Society of London, Chandos-street (Sept. 30th to Oct. 4th at 5 P.M.); on endocrinology at the National Temperance Hospital (Tuesdays and Thursdays, Oct. 8th to 24th at 8.30 P.M.); gynæcology at the Medical Society of London (Thursdays, Oct. 10th to Nov. 7th at 4 P.M.). Detailed syllabuses can be obtained from the secretary of the Fellowship, 1, Wimpole-street, London, W. 1. Courses and lectures are open only to members and associates of the Fellowship.

SPECIAL ARTICLES

PLASTER TECHNIQUE IN THE MODERN TREATMENT OF FRACTURES

BY K. H. PRIDIE, M.B. Lond., F.R.C.S. Eng.
SURGICAL REGISTRAR TO THE FRACTURE CLINIC AND ORTHOPÆDIC DEPARTMENT OF THE BRISTOL ROYAL INFIRMARY

THE great advance in traumatic surgery during the last few years has resulted from the adoption of the principles and methods of Dr. Lorenz Böhler, director of the Hospital for Accidents in Vienna. In his book on the treatment of fractures, which is available in translation to English readers,* he emphasises the vital importance to the community of the organised treatment of fractures, which should no longer be left to junior house surgeons to treat. There is probably no branch of surgery where the difference between efficient and inefficient treatment is so marked; for instance, a man with a simple fracture of the leg, instead of being back at work in three months, may be crippled for life with an ununited fracture or a painful leg. The saving of compensation and of lost wages repays the cost of the clinics many times over.

It is the organisation of these special clinics that is so important; first, because it is not economic to apply the method to individual and isolated cases, and secondly, because a great factor in the success of the method is psychological. To see other patients with leg injuries similar to his own walking without pain after a few days has such a good effect on the new patient that he is no longer a mental invalid, and very rarely is the compensation neurotic encountered. Many cases of Pott's fracture and fracture of the tibia can walk home the same day as their injury, and need not stay in bed one day. Many of them are able to carry on their work and women patients are able to look after their housework. But no amount of physiotherapy, electrical treatment, or massage will restore full function to a patient whose fracture has been incompletely reduced. It is waste of time and money for a patient with an unreduced Colles's fracture to receive massage and physiotherapy, for the end-result will only bring discredit to the masseuse.

A childish superstition of reverence surrounds a padded piece of wood. Often a patient is sent up to hospital in a splint whose weight is causing painful displacement of the bone-ends, for example, a back-splint and foot-piece used for a below-knee fracture. In the case of a Pott's fracture, a firm bandage over wool gives far more support than a back-splint and foot-piece where the foot is anchored to the splint and the tibia is free to rotate and cause displacement and pain. Patients in these splints dread being touched, and frequently remove them when the doctor has gone. Böhler has introduced the unpadded cast as a method of fixation after reduction. Plaster-of-Paris is unequalled for the fixation of fractures, but the method of application has to be learnt, and unless the surgeon knows how to apply these casts the results will be poor. After the application of unpadded casts the patients feel comfortable, they sleep at night, and no longer dread being touched.

The removal of splints for massage is wrong; there is risk of displacement of the fractured bone-ends. The only massage the patients need is the massage of function. Massage should not be allowed till the bones are firmly united; then, if the reduction has been satisfactory, and the patient has been using the limb, there will be full range of movement two weeks after removal of the plaster.

It is so essential for the teaching of students to secure a plaster of standard weight, strength, and application, that a bandage of constant composition must be used. Hospital-made bandages vary in different institutions, and even in different wards of the same institution. For these reasons I have adapted my technique to the three-yard Cellona bandage.† Cost and comfort have been the main factors in the evolution of this technique. The cost of the entire treatment is greatly diminished for these reasons:

1. The surgeon's time is only spent on reduction and fixation of the fracture.
2. Using these methods the majority of fractures can be treated as out-patients, hospitalisation being avoided.
3. Patients' visits and travelling expenses are reduced to a minimum.
4. Physiotherapy (a costly form of treatment) is only required in about 5 per cent. of cases, as compared with 100 per cent. using the old methods. The patient by his activity performs his own physiotherapy.
5. The majority of patients are able to follow their own occupation, without consequent loss of wages, and in any case disabilities and invalidism are avoided. Women can perform their household duties without outside help, and children can continue to attend school.

Besides this it is possible with the technique to produce casts of a

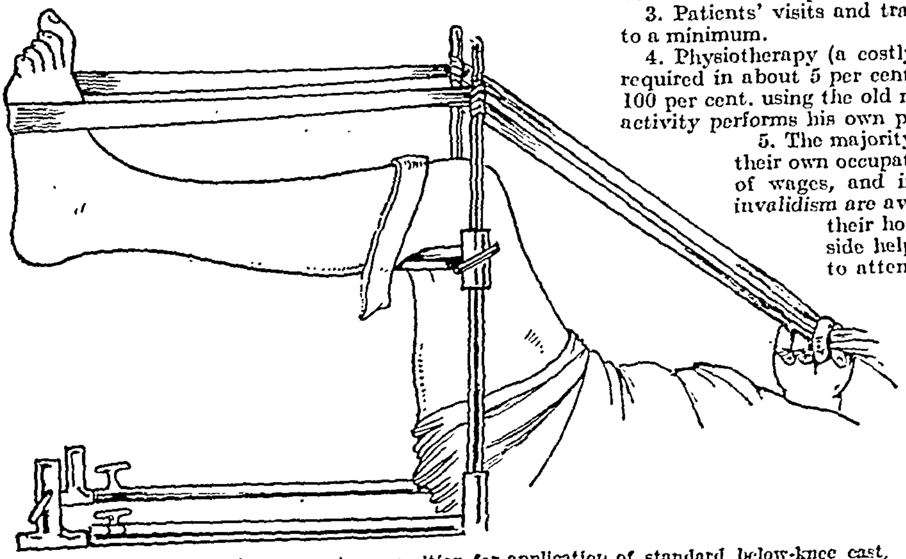

FIG. 1.—Böhler extension apparatus: position for application of standard below-knee cast, in cases not needing skeletal traction for reduction.

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* The Treatment of Fractures, by Dr. Lorenz Böhler. Fourth English edition. Translated from the German by E. W. Hey Groves, emeritus professor of surgery, University of Bristol. Bristol and London. 1935. (Reviewed in THE LANCET, 1935, i., 992.)

† The Cellona bandage, which is made by the manufacturers of Elastoplast (T. J. Smith and Nephew Ltd., Neptune-street, Hull), contains 90 per cent. by weight of plaster; the setting time may be regulated as desired; and although exceptionally strong, it is the lightest plaster bandage yet produced.

minimum weight, an advantage in ambulatory cases of lower-limb fractures.

First Principles

The three principles of fracture treatment are :

1. To reduce the displaced bone-ends as soon and as accurately as possible.
2. To maintain uninterrupted fixation of these bone-ends until union is firm enough to dispense with external splinting.
3. To use the affected limb as much as possible during the period of fixation.

The period of disability following any fracture is determined by the accuracy of reduction. The blood-vessels and lymphatics at the site of a fracture are often kinked or pressed on by displaced bone-fragments, causing œdema ; this indirectly leads to stiffness, muscle adhesions, and limited movement. Following a fracture, there may be three displacements :

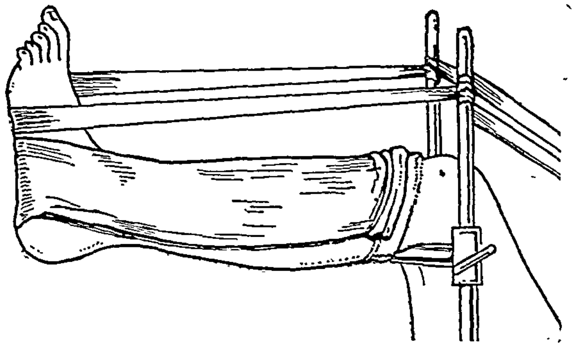

FIG. 2.—U-shaped slab applied to the limb ; the excess is turned back so that it does not project beyond the felt.

1. *Shortening.*—This can be easily corrected if the reduction is performed during the first few hours following the accident, but, if muscle-adaptive shortening has taken place, this deformity is extremely difficult to overcome. There is no excuse for shortening to occur in a fracture case, unless there has been actual loss of bony substance.
2. *Lateral displacement.*—It is frequently not possible to replace the bones exactly into their previous anatomical position, but provided there is no angulation, this lateral displacement may cause no disability, although it may give rise to swelling and prolong the time of healing.
3. *Angulation.*—Perfect apposition of bone fragments is of no use if angulation is still present. Angulated bones tend to bend and frequently cause arthritis in the joints above and below the fracture, due to the mal-direction of weight-force.

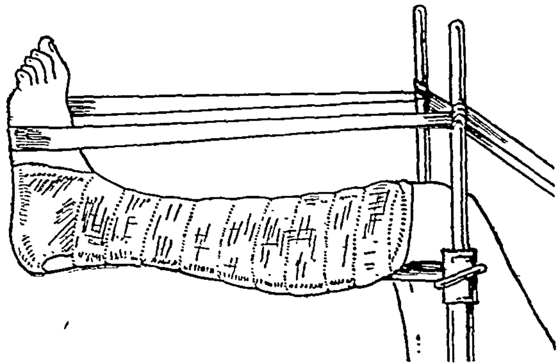

FIG. 3.—U-shaped slab fixed to limb by means of a wet gauze bandage.

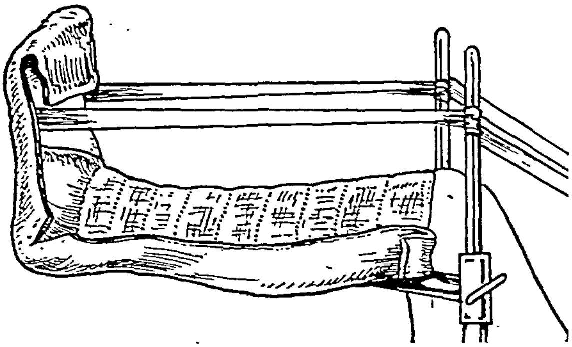

FIG. 4.—Back-slab applied.

If the function of the neighbouring joint is not to be severely handicapped, great care must be taken in the reduction of fractures of bones near joint surfaces, for example, fractures around the knee-joint, Pott's fractures, fractured surgical neck of humerus, supracondylar fractures, Colles's fractures, fractures of radius and ulna. The radius rotates around the ulna, and any marked angulation of the radius from its normal shape will block the movements of pronation and supination.

Stiffness of joints following an injury is chiefly due to muscle adhesions, and these do not form if the limbs are used during the whole period of disability. The following written instructions should be given to each patient at the first visit :

1. For the next 12 hours, when not actively moving the injured limb, it must be kept elevated and not allowed to hang down and thereby encourage swelling.
2. During the night time the injured part must be kept elevated above the rest of the body. For instance, the forearm must be placed on a pillow across the chest and the leg raised on a pillow resting on a box.
3. During the day the fingers, in the case of a fractured arm, must be kept moving constantly. An injured leg is to be used as much as possible and the patient should be able to walk up to one mile within the first week, increasing to greater distances in subsequent weeks. No crutches should be used, only sticks, which should be soon discarded. No slings to be used, but the hand, when not in use, must be kept elevated by making the fingers grip the opposite coat lapel.
4. Should the plaster become tight the patient must immediately report to the doctor, so that the plaster may be split. (In every cast a portion equal to at least a quarter of the circumference of the limb is extremely thin, and can be cut with ease.)

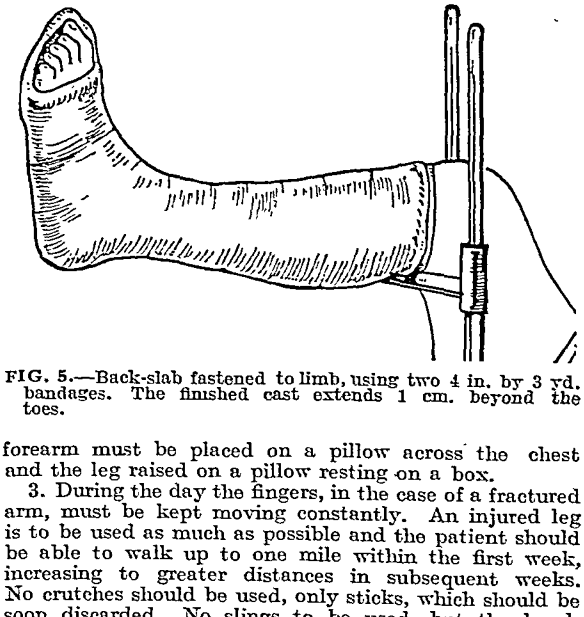

FIG. 5.—Back-slab fastened to limb, using two 4 in. by 3 yd. bandages. The finished cast extends 1 cm. beyond the toes.

Indications of too tight a cast are swelling, blueness, or numbness of the extremities, not relieved by elevating the limb, and inability to move the toes or fingers. The patients must be seen daily until there is no further fear of swelling. If a limb is *greatly swollen* when first seen, it is not completely surrounded by a cast until the following day.

Possible causes of failure in using this technique are:

1. The *fracture* may not have been reduced. Plaster casts must not be put on unreduced fractures.
2. The cast may fit badly. Complete plasters must not be applied to arm fractures on the first day, but only after reduction has been verified by X ray and the swelling has diminished. If a limb *is grossly swollen* at the time the fracture is reduced, the swelling must be massaged with the limb elevated before the cast is made. If this precaution is not taken the cast will become loose when the swelling diminishes. If the swelling cannot be reduced in this manner, a temporary, non-completed cast must first be used, until the swelling has been reduced.
3. Inadequate use of the injured part, leading *to stiffness of joints.*

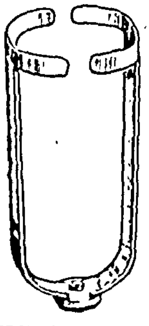

FIG. 6.—Böhler iron. Bristol pattern. (Medical Supply Association.)

Technique

1. The limb should be cleaned with ether soap. Strong antiseptics should not be used, as these kill the skin. *Dead skin under plasters forms* an excellent nidus for bacteria.

2. If the limb is obviously broken, and the fracture site is easily seen, the leg should be rendered painless by the administration of local anæsthesia into the hæmatoma between the fragments. The taking of true antero-posterior and lateral view radiograms is then no longer a painful procedure. Often the radiologist is unable to secure a true lateral view of a fracture because of the great pain entailed by moving the patient; local anæsthesia here relieves much suffering.

3. The limb should be reduced as soon as possible following the fracture. If the case is left, swelling and œdema will occur, and even skin blistering. If the reduction can be carried out within a few hours of the accident, no swelling will occur.

4. If the fracture for some reason cannot be reduced *immediately, the following* procedure is recommended:

(*a*) Any gross deformity can be corrected by hand. This relieves kinking of blood-vessels and tends to prevent swelling.

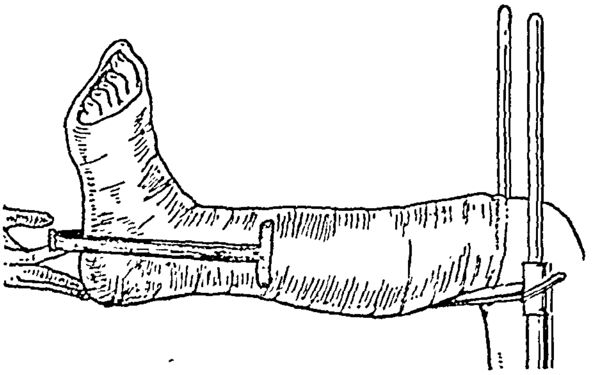

FIG. 7.—Application of Böhler iron.

(*b*) A firm bandage—e.g., Elastocrêpe—should be applied over wool, from the extremity of the limb to above the fracture site. This supports the tissues and prevents swelling.

(*c*) An adequate back-splint should be applied. A padded Cramer wire splint is light and efficient. A back-splint and foot-piece from toes to knee will do nothing but harm to a fracture *of the middle* or upper third of the tibia.

(*d*) The injured part should be kept elevated above the rest of the body, until adequate reduction can be performed and the fixation cast applied.

If the patient is to walk the same day as his fracture, which is the ideal to be aimed at, the following conditions are essential:

1. The reduction must be performed *before the limb* has swollen.
2. If the limb has swollen, this must be reduced by elevation, massage, and anodal galvanism, applied by means of pads. A complete plaster cast must never be placed *on a swollen limb.*
3. The limb must not be shaved before applying the plaster cast.
4. The *patient must be seen by the doctor the next* day.
5. The printed instructions already described must be given to the patient.

PREPARATION OF BANDAGES FOR USE

1. The total number of bandages required *for any* particular cast should be determined, removed from their containers and placed in an accessible position facing the operator.

2. All slabs should be made on an armoured glass plate, *the most suitable dimensions* for which are *40 × 12 ×*

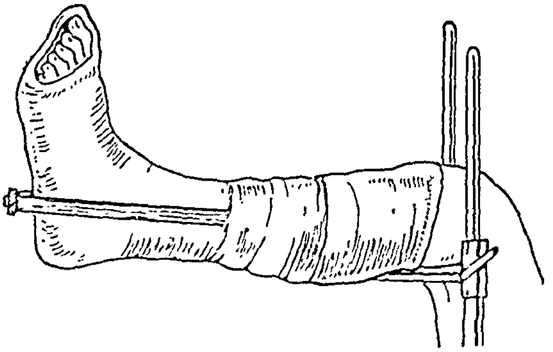

FIG. 8.—Bandage 4 in. wide holding top of iron.

½ *in.* The glass plate should be placed across the sink and tilted laterally so that any excess of water will run off; otherwise slabs will be too moist.

3. A glass rod, about 11 × ⅜ in., is inserted through the cardboard core. The complete bandage is immersed for *three seconds* in a bowl of tepid water. Both hands should be employed to remove the bandage and squeeze out excess moisture.

4. The loose end of the bandage is held on the glass plate and the bandage unwound by means of the glass rod to the requisite *length for the* slab. A second thickness is secured by unrolling the bandage on to the first layer, and the operation is repeated until the necessary *number of layers* are obtained. As the bandage is unwound the layers should be smoothed out by hand to remove all air cavities.

5. The finished slab, now ready for application, is slid off the glass plate on its long axis to avoid drawing the layers apart.

The Below-Knee Cast

1. When swelling has been reduced, the leg is placed as shown in Fig. 1. The bandage, which is held by the patient, is used to keep the foot dorsiflexed.

2. A strip of adhesive felt, 1¼ in. wide by ⅛ in. thick, is placed obliquely as shown in Fig. 1; it must be higher *anteriorly* than posteriorly, to allow full range of flexion later.

3. A slab 40 in. long is made with two *4 in.* by 3 yd. bandages. *This is applied* as a stirrup, from the adhesive felt on the inner side, round the heel, to the adhesive felt on the outer side (Fig. 2). The

slab is rubbed on to the limb and all air bubbles displaced. *This is essential during the whole process of application.*

4. This slab is held in position by applying a wet muslin bandage from above downwards to just above the ankle. This bandage should be of thin gauze 1½ in. wide with trimmed edges, and should be rolled on loosely (Fig. 3).

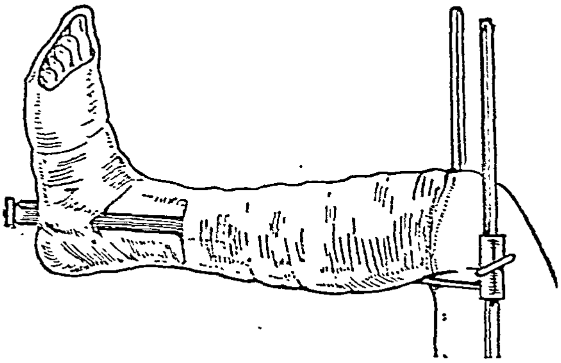

FIG. 9.—Bandage 4 in. wide holding bottom of iron.

5. A back-slab 40 in. long is now made from two 6 in. by 3 yd. bandages. This is applied working from above downwards, along the calf, over the sole of the foot, and the excess dropped temporarily over the toes. The operator now makes a cut 1 in. long on each side of the ankle-joint, so that the bandage will mould snugly round the ankle and heel (Fig. 4).

6. A 4 in. by 3 yd. bandage is applied in a circular manner from above downwards, a small fold being made in each turn (the crease of the fold coming over the back-slab and *not over the bare area of the tibia*); this allows for the slight contraction of the bandage in setting. The bandage will reach to the ankle-joint.

7. The portion of the back-slab which was thrown over the dorsum of the foot is now doubled back over the plantar surface, making a double support under the toes. This plaster should extend 1 cm. beyond the toes.

8. A second 4 in. by 3 yd. bandage is applied in a circular manner, extending from the ankle to the toe cleft (Fig. 5).

9. A slab 20 in. long is made from half a 4 in. by 3 yd. bandage. This is put round the top of the plaster tightly and held on by using the rest of the bandage. This completes the top of the plaster and makes it firm to stand the weight of the leg.

10. A modified Böhler iron (Bristol pattern, as shown in Fig. 6) is attached to the cast, in the axis of the tibia, and extending two fingers-breadth below the heel. The clearance of the iron must depend on the amount of dorsiflexion able to be produced. If the foot has been fixed in a position of dorsiflexion just over a right angle, two fingers-breadth is the ideal clearance. There must be sufficient height of iron to allow the plaster under the toes to clear the ground.

11. Half a 4 in. by 3 yd. bandage, applied tightly round the cast, holds the top of the iron (Fig. 7). The other half is used to lash the iron to the heel (Fig. 8). Heavy patients will require one whole bandage (4 in. by 3 yd.) in each situation.

Ten minutes after the application of this cast the patient may walk on the iron. He must be given the following instructions:

1. You must walk with a straight knee, and on no account go over on to the toe-support of the plaster, or this will wear out and crack.
2. When not walking you must keep the leg elevated.
3. Read the printed plaster instructions about visiting the doctor.

This is a standard cast for all ankle fractures except Pott's of the third degree. The indications for its use are:

1. Fractures of the metatarsal bones.
2. Fractures and dislocations of the mid-tarsal bones after reduction.
3. Fractures of the os calcis (with certain modifications).
4. Severely torn ligaments of ankle-joint.
5. First and second degree Pott's fractures.
6. Cases which have had operative correction for foot deformities such as Steindler's operation and tendon transplants, subastragaloid arthrodesis. A padded cast is first used for a week.

Number of bandages required ..	6 4 in. × 3 yd. 2 6 in. × 3 yd.
Weight of cast plus iron	2½ lb.

This cast is the standard basis of the long and the short casts, the long casts always being made in two sections, the first section being this standard below-knee cast.

The Mid-Thigh Cast

This is made in two sections, first to the knee as described above, and then to the mid-thigh, with the knee in extension, as follows:

1. A piece of adhesive felt 1½ in. wide and $\frac{3}{16}$ in. thick is placed round the mid-thigh.
2. A slab 30 in. long is made from two 6 in. by 3 yd. bandages. This is applied to the front of the thigh with a small fold back at the upper end from the adhesive felt above, to 8 in. down the tibia. The surplus is cut off and applied over the junction of the two plasters.
3. A back-slab is made from two 6 in. by 3 yd. bandages. This is similarly applied to the back of the thigh.
4. These slabs are fixed to the limb by two 4 in. by 3 yd. bandages applied in a circular manner.
5. A 4 in. by 3 yd. bandage is made into a slab and applied to go round and strengthen the top.
6. When the patient has large thighs it is advisable to apply, in addition, two lateral slabs made from 4 in. or 6 in. bandages, according to the size of the limb.

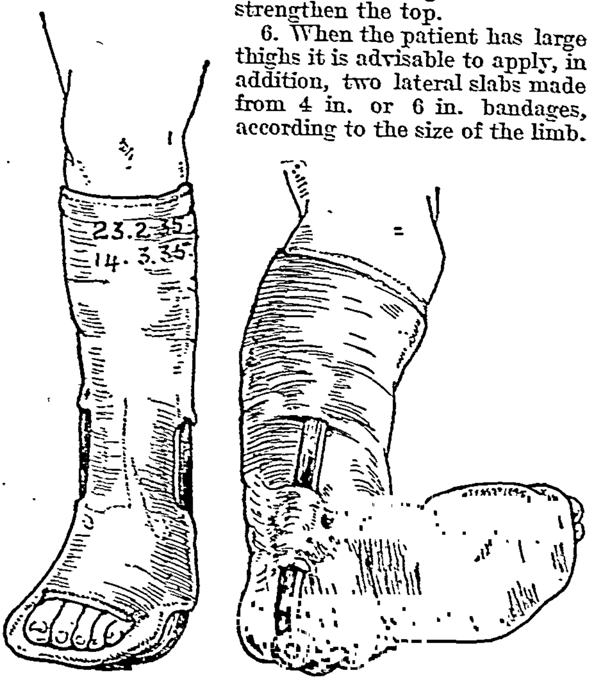

FIG. 10.—Standard below-knee cast completed. Note the date of reduction and the date of removal of cast.

Indications for the mid-thigh cast are:

1. Third degree Pott's fracture.
2. Pott's fracture in corpulent women, where the below-knee cast does not produce sufficient immobilisation to enable them to walk without pain.
3. Fractures of lower third of the tibia.

The Full-Length Walking Cast

This extends from the toes to the tuber ischii and is unpadded except for the top, which is constructed similarly to the top of a walking calliper. This cast is made in two parts. First, the standard below-knee cast is applied with the knee in flexion. The knee is then straightened and the cast continued up to the tuber ischii. The padded ring is made as follows:

A 4 in. by 2 yd. domette bandage is sewn round a ¾ in. roll of grey hospital felt, the felt being cut to the exact length of the circumference of the limb round the level of the tuber ischii.

The padding, which is now in a roll form in the middle of the bandage, is put round the top of the thigh so that it lies in the gluteal fold. It is knotted once over the great trochanter and then carried over the opposite shoulder where it is again knotted.

The cast is made as described below, and during the whole process of application the plaster is being constantly rubbed by the operator's hand to remove air bubbles.

1. Anterior slab, 40 in. long, consisting of two 8 in. by 3 yd. bandages, is applied from the ring at the top to 8 in. down the tibia over the lower cast. The surplus is cut off and put over the junction of the two casts, as before.
2. A similar back-slab is applied.

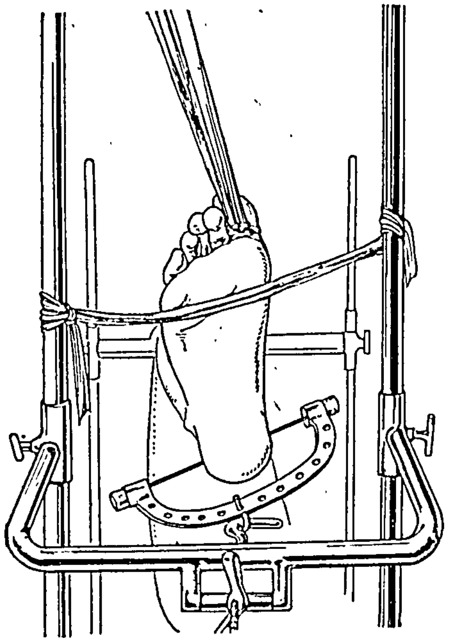

FIG. 11.—Traction with a Kirschner stirrup for difficult fractures.

3. Two lateral slabs are made, each from two 4 in. or 6 in. by 3 yd. bandages, according to the circumference of the thigh.
4. Two 6 in. bandages applied spirally now connect these four slabs together.
5. The top of the cast is now completed by a slab made from a 4 in. by 3 yd. bandage. Before this is applied the ends of the domette bandage are cut off 2 in. from the knot over the great trochanter, and these ends are turned down and incorporated in the plaster.
6. When the cast is dry the top is lacquered to preserve the surface, and enable the cast to be washed when soiled with excretions.

The indications for this cast are: (1) comminuted fractures of lower third of tibia; (2) fractures of mid and upper third of tibia.

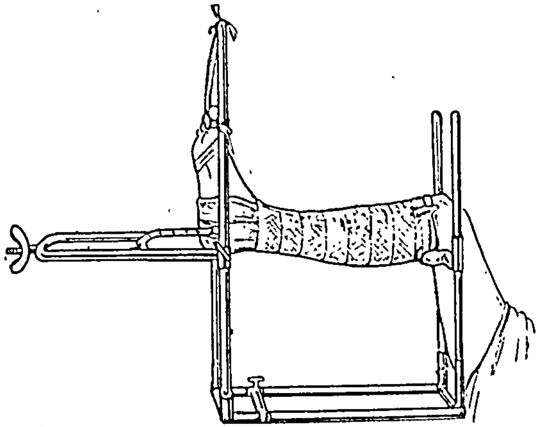

FIG. 12.—A spring balance to prevent overpulling.

Technique in the Swollen Limb

Often the surgeon first sees the case a day or two after the fracture, when the bones have been displaced, there has been a large effusion of blood, and the limb is swollen and œdematous; skin blisters may also be present. Blisters are only seen where the fracture has not been reduced and where a back-splint and foot-piece have been used. In over 800 cases treated by the skin-tight technique, blisters were never seen when the fracture case was reduced within six hours of the accident.

The first treatment should be to clean the skin with ether soap. The leg should never be shaved. If the leg is very flail it should be put straight manually and a firm bandage over wool applied. A padded Cramer wire back-splint is then applied, and the leg kept elevated above the rest of the body till reduction can be performed.

Swelling can be reduced by (1) anodal galvanism by bath or pads; (2) massage in elevation; (3) application of Bier's bandage from below upwards. If the limb at the time of reduction is very swollen a walking plaster must not be applied, because the plaster will rapidly become loose and cease to immobilise the fragments; the patient will then complain of severe pain and will not use the limb.

If the limb is very swollen it is impossible to tell when the bones have been accurately reduced; even if they have been adequately reduced they will become displaced again after the swelling has disappeared, owing to the looseness of the plaster. In such a case a 2/3 plaster is applied, which is kept as light as possible, and removed after the swelling has subsided, in from seven to ten days.

The 2/3 plaster is applied in a similar manner to the standard casts, the only difference being that the circular turns are not used. For instance, in the standard below-knee cast the stirrup-slab is first applied, then the back-slab, and the plaster completed with a wet gauze bandage from the knee to the toe cleft. If the fracture is situated in the lower third the plaster is taken up above the knee—that portion above the knee need not be of the 2/3 variety but can be completed. Swelling is never severe above the first joint above a fracture.

After the cast has set the patient is put to bed and the leg kept elevated for from seven to ten days. The best splint is Braun's which keeps the leg sufficiently elevated, and the foot of the bed is put on blocks. After seven to ten days this cast is removed and a walking cast applied.

In difficult fractures which need skeletal traction for reduction the leg is placed in the Böhler apparatus after a Kirschner wire has been introduced through the heel (Fig. 11). Screw-traction is applied from the Kirschner stirrup to the tension screw. A spring balance is placed as shown in Fig. 12, to prevent over-pulling. The foot is kept in the correct position thus :

1. The pull is exerted on the outer side of the stirrup to invert the heel.
2. The third toe is slung from the cross-frame.

After the reduction has been performed the limb is supported as shown in Fig. 12, and the standard below-knee cast is applied. Slots are cut in the stirrup and back-slabs, to make room for the Kirschner wire. When the plaster is completed the wire is immediately removed.

Ankle Fractures

1st and 2nd degree ..	Cast is of below-knee type.
3rd degree. Pott's ..	Cast is to mid-thigh.
Fracture of post-articular surface of tibia ..	
Lower third tibia ..	
Mid and upper third tibia	Cast is to tuber ischii.

If for any reason it is undesirable to apply the cast above the knee, a mid-tibial fracture may be adequately immobilised by the introduction of a Kirschner wire through the upper part of the crest of the tibia 2 in. below the knee-joint. The wire strainer and wire must be incorporated in the plaster.

(To be concluded)

MENTAL CARE IN 1934

BOARD OF CONTROL REPORT

IN part I. of its report (H.M. Stat. Office, 1*s.* 6*d.*) for the year 1934, the Board of Control (Lunacy and Mental Deficiency) sound a warning that the incidence of mental disorder is increasing at a greater rate than the provision of accommodation. Minor changes provided 1177 new beds ; the total number of patients increased by 2125 and the number of patients in excess of the authorised bed space on the first day of this year was nearly 2000. This, the Board state, would not in itself be a serious shortage but for the slowing-down of new building. Only one new hospital—for Southend and East Ham—is actually being built and, though several others are in contemplation, they are not likely to be ready for four or five years. The shortage of accommodation may become much more serious, say the Board, before it can be appreciably relieved by new construction. The increase in the total number of patients, however, does not give definite evidence that the incidence of mental disorder is increasing, certainly not to an extent which would justify some of the alarmist statements in the lay press.

Satisfactory progress is reported in the administration of the Mental Treatment Act. The number of out-patient centres established in connexion with public mental hospitals is now 134. The Board single out the admirable work of the Hertfordshire Mental Hospital at Hill End, which in addition to many other beneficent activities has established the St. Albans Nerve Clinic (the old-world name was chosen in deference to public taste) where part-time psychotherapists, with the help of trained social workers, assist in providing a form of treatment for which the permanent medical staff often cannot afford the necessary time. This clinic is a splendid example of organisation on a team-work basis.

The number of voluntary admissions to public mental hospitals increased by 1117 and is now over 4000. Admissions under certificate have decreased by 513. The Board note, however, with some uneasiness that a number of mentally defective children of relatively low grade have been admitted as voluntary patients. It is open to doubt, they remark, whether such cases can legally be dealt with under the Act, and they find it difficult to appreciate the grounds on which medical practitioners have given necessary recommendations. They regard this as an abuse of the Act, calculated to bring voluntary treatment into disrepute, and may decide to order the discharge of such defectives as unfit to remain as voluntary patients. The number of temporary admissions increases slowly, but improvement has been noticeable. Many rate-aided patients continue to be certified although a little more time and trouble would give them the benefit of temporary treatment ; the Board have issued a circular for the guidance of relieving officers and hope that it will lessen the difficulties of this complicated section of the Act.

FALSE ECONOMY

The Board learn with regret that one of the largest authorities in the country has decided to reduce the number of medical staff in some of its hospitals. This step, they declare, is all the more unfortunate because the existing medical staff in most public mental hospitals is inadequate if patients are to receive proper individual attention. They cannot believe that the relatively small saving which can be made by reducing a medical officer here and there can be anything but wasteful in the long run. To expand buildings and to diminish staff is, they say, never economical. They also deplore the gradual diminution in the number of whole-time chaplains in mental hospitals. Visiting committees, they say, tend more and more to arrange with the nearest incumbent to undertake the necessary services in return for a stipend which barely represents the cost of an additional curate. The work is therefore done in a more or less perfunctory way by an already busy *incumbent*, or else farmed out to an extra curate. They suggest that, although the visiting committee are primarily responsible, yet it is within the competence of the bishop, whose licence is required for the appointment of a chaplain, to consider whether the conditions attaching to the appointment promise that the duties will be adequately discharged. A chaplain who can spend time in the wards and has the tact and sympathy which call for the confidence of patients does work of therapeutic as well as spiritual value. There is an abundant outlet for the energies of a keen chaplain in educational and recreational work. The Board plead that mental hospital appointments should entitle the holder to relief and transfer at the end of a reasonable time, and that good work should receive more recognition in the selection of men for preferment.

The value of occupational therapy is emphasised, and the Board urge the appointment of whole-time organisers. They do not consider that nurses who learn a craft need necessarily receive extra pay ;

craft-teaching adds to the interest of the work and makes the patients easier to handle, and a specially gifted nurse may secure a post as technician or craft-worker, or may undergo training and qualify as an occupational therapist. To give extra pay seems to the Board to approach the matter from a wrong angle and to invest with a special character what should be a matter of routine. The Board also points out the value of recreations and ward gardens, and of hairdressing and dress facilities for restoring the self-respect of women patients.

RESEARCH

The Board received communications from over fifty institutions reporting progress made in various lines of research. Dr. T. C. Graves, of Birmingham, reports that macroscopic evidence of chronic infection of the nasal sinuses was found in 51 out of 81 post-mortem examinations. The amelioration of mental disorder which follows treatment of bodily disease has, he says, been apparent to all who have been in close touch with the patients. He lays stress on the importance of examining sphenoidal sinuses, and again emphasises that until sepsis of the ear, nose, or pharynx has been treated, real progress towards mental and physical recovery is not made. At Warwick it was discovered that operative procedure did not benefit schizophrenia and manic depressive states but benefited certain confusional states. The visiting dental surgeon at St. Andrew's, Northampton, is not satisfied that dental infection is related to the psychoses except in a few cases. Stereoscopic radiography has been carried out on all admissions but no case of sinus infection was detected. Cardiff continues to test all recent admissions for tuberculosis, and Wadsley (Sheffield) finds that the examination of fæces for the tubercle bacillus is invaluable. Of 41 patients with positive results in the fæces the sputum was positive in 9, negative in 8, and in 24 not obtained or unobtainable. At Long Grove no definite difference was found between cases of dementia præcox and controls in respect to tuberculin, and at Norfolk 25 cases of dementia præcox showed negative blood and cerebro-spinal fluid. At Bristol the routine inoculation for dysentery has been continued and the result has again been most gratifying.

At Storthes Hall the Meinicke clarification reaction was found to agree with the Wassermann in nearly 99 per cent. of 229 admissions, and at Long Grove, where four thousand sera have been examined, agreement has been shown with the Wassermann in all types of cases. As the Meinicke test is much more easily performed, this confirmation of its value is most important. At Winwick the presumptive Kahn test proved in a large series of cases to be practically as good an exclusion test with serum as the micro-Meinicke, but St. Albans considers that the Kahn test is not sufficiently reliable to substitute for the Wassermann. At East Sussex the Kahn flocculation is used concurrently with the Wassermann, and close agreement is found; it is considered that the concordance of these tests is of much greater value than one alone. The Wassermann test, according to the Royal Eastern Counties Institution at Colchester, is often unreliable as a test for congenital syphilis, and cases are being re-examined by the presumptive Kahn test.

Dr. Shaw, of Stafford County, makes an interesting report of the state of the kidney in psychotic patients. He has rarely, he says, found a really healthy kidney at autopsy. Of 242 direct admissions in the year, albumin was present in 45 per cent. and more or less persistently in 70 per cent. of these. Mental hospital patients show "almost constant fatty and exhausted livers," which may furnish evidence of strain and failure in detoxication, with resulting effects upon other tissues. At Barnwood House recurrent attacks of excitement, ascribed to sympathetic stimulation, in a schizophrenic patient have been aborted by acetylcholine.

The Exminster Hospital, Devon, reports good results from the paretic patients it has treated by induced malaria. Out of a total of 79 cases, 32 have been discharged and only four have returned to hospital. Fifteen have continued to improve mentally and 12 have reported good physical health. The mental condition of five was stationary and in two was deteriorating. Ten were in regular employment. In all, 54 are alive, but before malarial treatment was introduced no general paralytic survived longer than three years from admission. Dorset reports a remission-rate of 30 to 35 per cent. from tryparsamide and pyrifer, but the Board considers that malaria still holds the field.

Prolonged narcosis is being investigated by several institutions. Cardiff employed somnifaine in most of 107 mixed cases of mental disorder, eliminating toxic symptoms by glucose and insulin. In schizophrenia the best results were obtained in depressed cases, the least satisfactory in catatonic stupor. In manic-depressive cases 37·7 per cent. are said to have recovered as a direct result of the treatment. Dorset, however, did not obtain satisfactory results, and considers the procedure too dangerous for routine use. This hospital has found that manganese chloride intravenously seems to mitigate catatonic symptoms.

Cardiff contributes a long and interesting report on biochemical investigations.

Mental Deficiency

Steady progress is reported by the Board on the mental deficiency side, and during the year 2026 additional beds were provided in certified institutions. Several big schemes are well under way, including Botley's Park. Considering that the Board have during the last four years put no pressure on local authorities, it is remarkable that the rate of progress has been so well maintained. Comparatively few counties have not made at least a beginning with the provision of beds. The transfer of public assistance institutions to the county and county borough councils has materially contributed to the growing realisation of the cost of neglecting mental defect. The review of accommodation necessitated by the Local Government Act, 1929, brought home to local authorities the extent to which the existing poor-law expenditure was traceable to defectives, and showed that to deal with mental defect through the machinery of the poor law was neither efficient nor economical. The position in Wales, particularly North Wales, is, however, still far from satisfactory, and except in Glamorgan there is little prospect of improvement. In the more thinly populated counties in England and Wales alike the position cannot be expected to improve until agriculture is stable and prosperous.

The Board express uneasiness over the notification of defective children by local education authorities. The local mental deficiency authority, they point out, has no power to deal with children between the ages of 7 to 16 unless they have been notified by the local education authority. This authority can only notify ineducable children and feeble-minded children who are leaving special schools or classes, except where a child could not be taught in a special school without detriment to other children, or the Board of Education certify that there are special circumstances. Special schools have not developed as was anticipated in 1913. Thay are recognised as being impracticable in rural areas and small towns, and even in the larger towns there is sometimes a tendency to merge the feeble-minded and the educational defective with the backward children for educational purposes without certification. This change of policy is in accordance with the recommendations of the Wood Committee, and the Board do not criticise it. Nevertheless, they point out, it clearly restricts in the most unfortunate way the power of local education authorities to notify mentally defective children. The result is that large numbers of defective children who have been retained in ordinary elementary schools cannot be notified when they leave at the ordinary leaving-age, although their defectiveness is well known to their teachers and to the school medical officers. The local mental deficiency authority can do nothing till these children reach the age of sixteen, and then only if they are "subject to be dealt with" under one of the other provisions of the Act. Feeble-minded children are left at a most critical period in their lives without the supervision and control which Parliament intended to give them. Even at the age of sixteen the local mental deficiency authority can do nothing with them unless they are neglected or break the law. Some will find their way into institutions after the opportunity for continuous care and training has been lost, and many will have hardened into delinquent ways. A number who with proper supervision ought not to need institutional care will have got into trouble for want of a helping hand, and some will have so deteriorated that they can no longer be left at large.

The smaller number of notifications from local education authorities may, the Board consider, partly be due to a failure to realise the need of adult defectives for community care, and partly to a lack of provision for care and training outside institutions. Some education authorities are reluctant to take a step which stamps the notified child as being in a class apart. The Board condemn this attitude as wrong, declaring that there is no sharp line dividing the feeble-minded from the dull and backward. The more complicated the social fabric, they say, the greater the need of the defective to have a space found in it for him. Segregation, except for purposes of training, should be a last resort. There is all the difference between a defective left to fend for himself, unprotected and with his weaknesses unrecognised, and one who is given special training, protection, and control. The local authority has the double responsibility of seeing that every defective has proper training and occupation, and of showing the public how to protect mental defectives as they would the cripples and the blind. The expenditure is worth while economically and socially.

CHESHIRE HOSPITALS.—The local authorities in Cheshire have under consideration plans for the provision of adequate hospital accommodation for infectious cases, other than small-pox. Under this scheme a total of 448 beds will be available for a population of 672,781. At present more than half of the 50 county districts have agreements with outside authorities for isolation hospital service and have no control over the hospitals used, and under the new proposals the number of available beds would be increased by 77. It is estimated that the cost will be about £54,900.

MEDICINE AND THE LAW

Alleged Masquerading under Doctor's Name

PROCEEDINGS were instituted at Birmingham earlier in the present month against a man named Ernest Peace Freeman who was alleged to have adopted the name of Dr. Louis Rabinov, a registered medical practitioner residing in Melbourne, Australia. The prosecution stated that Freeman came to Birmingham last year and purchased the practice of Dr. Alexander at Hall Green. He sold it last April to a practitioner from Westcliff-on-Sea for £660. The purchaser afterwards discovered that drugs and fittings had not been paid for. Mr. M. P. Pugh, who prosecuted, said that it had been ascertained that the real Dr. Rabinov was practising in Australia and that Freeman was an impostor who masqueraded under Dr. Rabinov's name. There would, he said, be further charges against Freeman of obtaining £13 worth of drugs and fittings and of obtaining money from the purchaser of the practice and from other persons by the false use of a registered medical practitioner's name. Mr. Pugh added that there had been complaint from the Selly Oak Hospital, Birmingham, that Freeman had been attending lectures in obstetrics at the Dudley-road Hospital and had been examining women. On behalf of the accused it was denied that he had ever been to the Dudley-road Hospital though he seems to have admitted, since his arrest, that his name was not Rabinov, and that he was not a doctor. He was really the owner of the Royal Marine Hotel, Cowes. A police officer told the bench that the real Dr. Rabinov had written a letter which led to investigations. Freeman was remanded on bail till Sept. 26th.

Sequel to Sydney "Shark Arm Case"

We noted previously (THE LANCET, July 6th, p. 40) the quashing of an inquest in Australia on the arm of a missing man believed to have been murdered; the arm had been disgorged by a shark and, though the only part of the corpse to be found, was identified by tattoo marks. The deceased was a boatman who disappeared in April. Soon afterwards a shark, captured in the sea off Sydney and kept alive for a few days in a public aquarium, disgorged the limb. On the day before the inquest proceedings were opened a boatbuilder named Holmes was murdered by unknown men. He had previously made a statement apparently incriminating a third man named Brady as the possible murderer of James Smith. The judge ruled that Holmes's alleged statement was inadmissible against Brady upon the charge of murder. Brady was acquitted. The case is therefore not to be added to the exceptional group of trials where a man has been found guilty of murder in the absence of the corpse.

PARIS

(FROM OUR OWN CORRESPONDENT)

TETANUS IMMUNISATION

LAST week (p. 625) you mentioned the steps now taken to prevent tetanus in the French army. The report of the commission appointed to study the matter is now to hand. The members of the commission, whose president was Dr. Fredet, included Dr. Pierre Duval, Dr. Gosset, Dr. Rouvillois, and Dr. Louis Bazy, who is surgeon to the Saint-

Louis Hospital. Their report to the Société Nationale de Chirurgie is a strong plea for wholesale, systematic, active immunisation with the Pasteur Institute's anatoxin in the place of random passive immunisation with serum, 650,000 ampoules of which were issued by the Pasteur Institute in 1934. To stress the comparative futility of serum treatment, the Commission note that in more than 70 per cent. of the cases of tetanus observed the infection was carried through some trifling injury such as a pinprick or a superficial scratch, and in more than 6 per cent. the site of entry of the germ was not demonstrable. Tetanus serum is apt to be given too late, but whatever may be decided about the routine use of a vaccine, serum will still have a limited field of action, notably in those cases in which the subject of severe infected injuries has not already been vaccinated against tetanus, and is in need of passive immunisation at once. In such cases the Commission recommend a subcutaneous injection of tetanus anatoxin in the scapular region followed about a quarter of an hour later by a subcutaneous injection of serum in the abdomen or thigh; much importance is attached to these two injections being in different parts of the body. The Commission are in favour of combining tetanus vaccination with the typhoid and paratyphoid vaccination already compulsory in the army. For children, tetanus and diphtheria vaccination could be combined. The Commission are in favour of repeating such vaccination every year or two, in spite of the fact that, according to Ramon and Zoeller, the immunity conferred by tetanus vaccination is still demonstrable five years later.

A SANATORIUM FOR FRENCH STUDENTS

Some ten years ago the late Prof. Léon Bernard declared that French tuberculous students should have a sanatorium of their own. This suggestion bore fruit when a sanatorium, differing in many respects from the typical private or public institution, was built at St. Hilaire-du-Touvet, overlooking a wide expanse of characteristic French scenery. Though this sanatorium began to receive patients two years ago, it was not till this summer that it was officially opened by M. Herriot. On this occasion Dr. Rist drew attention to the revolutionary changes which have come over the régime prescribed for the tuberculous since the days, still in the memory of the present generation, when the physician in charge ambled round from one patient to another, preaching the gospel of the simple life and keeping up his patients' morale. The part he played was so easy that he could manage some 150 patients unaided. In the sanatorium of to-day, the deck chair has been relegated to a position of minor importance, and treatment has become highly technical, active, and operative, with collapse therapy requiring great manipulative dexterity and the aid of many ancillary services, not least those of the radiologist. The sanatorium has also become a centre of scientific research and of teaching—functions which require team-work in a large institution. The small, isolated building is, or should be, as dead as your Queen Anne.

LABORATORY ASSISTANTS

In a recent number of *Concours Médical* Dr. G. Lavalée takes exception to the growing custom of employing untrained young women as laboratory assistants. He would find a place here for the poor medical student who at present earns money by hawking patent medicines or even ushering cinema patrons into their seats in the intervals between lectures and examinations. Dr. Lavalée holds that where important verdicts depend on the accuracy, conscientiousness, and judgment of such assistants, the scientific sta of the laboratory has no right to cover unskille labour. This staff would doubtless have an answe ready—that supervision is vigilant, that procedure are checked at all stages, and that the interpretatio of a result by a medical student working in his spar time is no more likely to be accurate than one b a permanent member of a laboratory staff, howeve superficial is her knowledge of pathology. Dr Lavalée's plea for the employment of needy medica students in laboratories may impress their directors but surely not to the point of dismissing a singl competent employee.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE TASK OF THE HOSPITALS COMMISSION

A REPORT of the Irish Hospitals Commission was presented to the Minister for Local Government and Public Health early in the summer, but up to the present no information has been given as to its contents. The secretary of the commission has, however, addressed a letter to certain local authorities in which a little light is thrown on the present position of the commission's labours. He states that, in accordance with the Public Hospitals Act, 1933, a survey of hospital facilities in the Irish Free State is being made. The survey has been completed as regards voluntary hospitals, and much valuable information has been acquired. As no survey of hospital facilities would be complete without the inclusion of hospitals, infirmaries, and sanatoriums under the control of local authorities, the upkeep of which was provided mainly out of rates, a questionnaire is being issued, asking the average number of patients, number of beds, numbers admitted and discharged during the year, average cost, and other matters. The questionnaire has been designed to elicit information regarding all types of hospitals and institutions under the control of local authorities, which provide facilities for housing and treating the sick.

THE LATE DR. J. T. ELLIOTT

The death is announced of Dr. John Trimble Elliott, of Smithborough, the doyen of the medical profession of County Monaghan and one of the most respected of country practitioners in Ireland. Dr. Elliott qualified 54 years ago and has spent nearly all his professional life as dispensary medical officer of Smithborough. A modest and unassuming man, he had a fund of shrewd common sense which made his services much sought after on both professional and lay committees. He took an active part in medical organisation and was for many years a member of the council of the Irish Medical Association and honorary secretary for his county. He was also a strong supporter of the Royal Medical Benevolent Fund.

LLANELLY HOSPITAL.—The total income for this hospital last year was £11,809, the highest figure yet reached, and the patients admitted numbered 3809, an increase of 555 over the previous year. Expenditure amounted to £10,657, so that the excess of income over expenditure was nominally £1152, but actually after allowing for depreciation only £684. A new nurses' home is being built and, apart from equipment, will cost over £11,000.

PANEL AND CONTRACT PRACTICE

The Drug Habit

LAST year the average chemist's bill of an insured person was 2*s.* 11*d.*, a halfpenny less than in 1933. The curious thing is the extent to which this figure varies in different parts of the country. According to a report presented to the Association of Welsh Insurance Committees in session at Barmouth earlier in the month Manchester and Salford head the list with 4*s.* 10*d.* In his report for 1933 Sir George Newman mentioned the twenty insurance committee areas in England with the highest drug costs, stated in pence and decimals of a penny. In descending series these were: Manchester, 58·139; Salford, 57·863; Rutland, 50·027; Barrow-in-Furness, 49·031; Kingston-upon-Hull, 47·392; Oldham, 46·673; Preston, 45·887; Leeds, 44·654; Southend-on-Sea, 44·558; Blackburn, 44·000; Gateshead, 43·194; Stockport, 43·112; Liverpool, 42·500; South Shields, 42·475; Bury, 41·604; Birkenhead, 41·217; Newcastle-on-Tyne, 40·987; Birmingham, 40·849; Lancashire, 40·362; Cheshire, 40·224. It must excite surprise that such a health resort as Southend-on-Sea should be so high up on the list. London took fifty-third place with 35·75 pence per insured person, while the area in England with the lowest cost was Oxford with 21·99 pence. Districts though neighbours geographically may be found far apart in the tables: for instance, Gateshead 43 pence, Middlesbrough 29 pence; Kingston-upon-Hull 47½ pence, Grimsby 29½ pence. The figures for Wales varied from 21·14 pence in Radnor up to 36·62 pence in Caernarvon, the average for the principality being 32·19 pence. In Scotland, apart from Zetland where the cost was 45·1 pence, the most expensive area cost only 34·02 pence. But, lest it be assumed that insured persons in Scotland do not receive their fair share of physic, it should be recalled that in Scotland medicines required for the treatment of insured persons with tuberculosis are provided by the local authority and not out of the insurance committee's drug fund.

In Scotland too doctors have never adopted the custom of dispensing medicines for their patients and a bottle of medicine has not become the necessary corollary of a visit to the doctor. In England, for generations past, doctors with very few exceptions have dispensed all medicines for their wage-earning patients who have come to regard a visit to their doctor as synonymous with the receipt of medicine. As a result the cost in England of providing medicine per head of insured population regularly exceeds that in Scotland by approximately 50 per cent. Part of the increase in the cost of supplying medicine to the insured population is no doubt due to expensive forms of treatment such as insulin and liver extract, which have been introduced in recent years. The very fact that new methods of treatment are yearly being made available renders it incumbent on all concerned to utilise available funds to the best advantage. It will be observed that, among the first 20 places in order of expense, 11 are held by the county of Lancashire, probably a sequel to an old county custom for the household to have a standing account with the doctor on which an amount was paid weekly to a collector. They believed in a bottle of medicine and insisted on getting it and paying for it. When national insurance was first introduced suspicion of the Act caused many Lancashire people either to make no selection of doctor or to pay for their medicine through other sources. But when the economic depression came they had no option but to look to their insurance doctor for the medicine which they thought they required. Variation in prescribing cost might be due partly, as Sir George Newman has suggested, to the teaching of particular medical schools, and the adoption of these views in practice by students after qualification, but the examples of Lancashire and Scotland do not support that. What the Welsh association made of these figures we shall await with interest. At present there is no generally accepted explanation of the extraordinary variations in prescribing costs in comparable areas. There is also no evidence, so the late C.M.O. says, that in those areas where the habit of taking medicine is highly developed a more satisfactory standard of health has been achieved.

Tuberculosis in Wales

The importance of early notification of tuberculosis was emphasised by the chairman of the Welsh Board of Health, Mr. John Rowland, in an address to the Welsh Association of Insurance Committees. The success of the work of the Welsh National Memorial Association obviously depends on getting hold of cases in the early stages of the disease. The tuberculosis death-rate was, he said, steadily falling in Wales—the rate for 1934 was the lowest on record—but not as quickly as in England and Scotland, where the death-rate was 20 per cent. lower. Economic distress in the principality might have been one factor in retarding progress, but the greatest improvement had occurred, generally speaking, in the western counties of Wales, where tuberculosis mortality had always been high. In the subsequent discussion Mr. J. E. Tomley of Montgomery related some important evidence. The tuberculosis physician for Cardiganshire, after referring to the serious increase in the number of deaths from tuberculosis in that county, had, he said, admitted that out of a total of 61 deaths in 1934 there were 30 which had not been referred to the Association's officer. He also stated that in reply to the usual questionnaire no reason was given in 18 cases. In Montgomeryshire, on the other hand, there were no non-notified deaths, and the death-rate in that county was the lowest recorded. The report from Anglesey and Caernarvonshire showed that out of 206 persons who died from tuberculosis in that area during 1934 only 158 were seen by the Association during life, and 35 died of phthisis within three months of being first seen; a good proportion of these were insured persons, and the tuberculosis physician hesitated to credit the whole blame to the acuteness of the disease. The same seems to be true in measure of some other Welsh counties. The Association, through its individual insurance committees, is appealing to insurance practitioners for their help in the matter.

Surgical Spirit

Some confusion still exists in the minds of doctors and of chemists as to the effect of changes made by the Board of Customs and Excise in the regulations about surgical spirit. This cannot now be obtained over the chemist's counter. If a doctor wishes to obtain it for his patient he must issue a prescription requiring the chemist to provide Spiritus Antisepticus of the National Formulary or, alternatively, he may write out the prescription in full. The Ministry, after consultation with the Insurance Acts Committee, recently issued an explanation to both doctors and chemists which provides that where the term "surgical spirit" is used in a National Health Insurance prescription without qualification, it should be interpreted to mean the formula under Spiritus Antisepticus (Surgical Spirit) in the National Formulary, 1933.

The B.P. Codex, 1934, contains two formulæ for Spiritus Chirurgicalis B.P.C., and where a doctor orders Surgical Spirit No. 1 or Surgical Spirit No. 2 his intention has to be interpreted to mean formula No. 1 or formula No. 2 as the case may be. These formulæ were approved by the Board of Customs and Excise as from March 15th, 1934. Both formulæ contain industrial methylated spirit, castor oil, and diethyl phthalate. The former, in addition, contains methyl salicylate and the latter mineral naphtha. The difference between the two formulæ will be immediately obvious to the patient, and doctors have accordingly been advised carefully to specify in their prescriptions the particular formula they desire. In addition to the two forms of Spiritus Chirurgicalis there are also two forms of industrial spirit—namely, Spir. Meth. Indust., B.P., 1932, and Spir. Meth. Indust. sine Aceton., B.P.C., 1934. Practitioners are reminded that the latter preparation is preferable for surgical purposes, as it is compatible with iodine. The former, when brought into contact with iodine, produces an irritating compound by reaction between the iodine and acetone.

To put the position briefly, prescriptions will be interpreted as follows: Surgical Spirit=Spiritus Antisepticus (N.F.). Surgical Spirit No. 1=Spiritus Chirurgicalis, B.P.C., 1934, formula No. 1. Surgical Spirit No. 2=Spiritus Chirurgicalis, B.P.C., formula No. 2. It is hoped that the next edition of the National Formulary will provide that in the absence of any directions from the prescriber Surgical Spirit No. 1 shall be dispensed when surgical spirit is prescribed. Further, it will probably be laid down that acetone-free industrial methylated spirit shall be used for all formulæ unless otherwise directed by the prescriber. Unless and until such provision is made, however, the position will be as here indicated.

OPENING OF THE MEDICAL SCHOOLS

IN connexion with the opening of the session at the London medical schools the following arrangements have been made :—

Charing Cross Hospital

A post-graduate course for former students will be held on Oct. 5th and 6th. The annual dinner will take place at the Café Royal at 8 P.M. on Saturday, Oct. 5th, with Rev. A. W. Oxford, M.D., in the chair. On Friday, Oct. 25th, at 4 P.M., Sir Kingsley Wood will distribute the prizes and deliver an address.

Guy's Hospital

On Tuesday, Oct. 8th, at 3 P.M., Sir Kingsley Wood will deliver the inaugural address. The biennial dinner will be held at the Connaught Rooms, Great Queen-street, W.C., on Nov. 15th at 7 P.M., with Mr. A. W. Ormond in the chair.

King's College Hospital

On Saturday, Oct. 5th, from noon to 6 P.M., and on Sunday morning there will be lectures and demonstrations open to all practitioners. Post-graduate lectures on tuberculosis will also be delivered in the lecture theatre of the medical school on Thursdays at 9 P.M. from Oct. 3rd onwards. The annual dinner of past and present students will be held on Oct. 5th at the Mayfair Hotel at 8 P.M., with Sir Charlton Briscoe in the chair. On Oct. 10th Dr. G. F. Still will deliver the inaugural address.

London Hospital

A post-graduate course for former students of the hospital will be held from Oct. 16th to 19th. The old students' dinner will be held on Thursday, Oct. 17th, at 7.30 P.M., at the Trocadero Restaurant, with Prof. H. M. Turnbull in the chair.

Middlesex Hospital

A post-graduate course for former students of the hospital will be held from Sept. 28th to Oct. 1st. On Oct. 1st the annual dinner will be held at the Savoy Hotel at 7.30 P.M., and Dr. H. Campbell Thomson will be in the chair.

Royal Free Hospital

On Tuesday, Oct. 1st, at 3 P.M., the inaugural address will be delivered by Sir Walter Moberly. The annual reunion dinner of the old students will be held on Nov. 28th at the Savoy Hotel, when Dr. Letitia Fairfield and Commander Stephen King-Hall will be among the guests of honour.

St. Bartholomew's Hospital

On Tuesday, Nov. 5th, the old students' dinner will be held at 8 P.M. in the College Hall, Charterhouse-square, with Mr. W. Girling Ball in the chair. The Prince of Wales will be present.

St. George's Hospital

On Wednesday, Nov. 13th, Lord Macmillan will give an address at the annual prize-giving which will be held in the board room at 3 P.M. The annual dinner will take place the same evening at Claridge's Hotel at 7.30 P.M.

St. Mary's Hospital

A week-end post-graduate course will be held from Sept. 27th to 29th, open to all medical practitioners without fee. The annual dinner of past and present students will take place at Claridge's Hotel on Sept. 28th at 7.30 P.M., with Dr. Duncan Fitzwilliams in the chair.

St. Thomas's Hospital

Sir Cuthbert Wallace will preside at the old students' dinner, which will take place at the Dorchester Hotel at 7.45 P.M. on Oct. 4th.

University College Hospital

On Tuesday, Oct. 1st, at 4 P.M., a reception will be held in the library of the medical school. The annual demonstrations for old students will take place on Oct. 10th and 11th, and the annual dinner will be held in the library of the medical school on Oct. 11th at 7.30 P.M., with Sir George Welch in the chair. The annual dinner of the Women's Association will be held at the Piccadilly Hotel, W., at 8 P.M., on the same day, and Dr. Annis Gillie will preside.

Westminster Hospital

On Monday, Sept. 30th, at 3 P.M., the winter session will open at the Caxton Hall, Westminster, when Major Ian Hay Beith will deliver the inaugural address. He will speak on the Privileged Profession. A short course, open to all medical practitioners, will be held on Sept. 28th and 29th, and the annual dinner of past and present students will take place at the Trocadero Restaurant on Saturday, Sept. 28th, when Dr. Vivian Orr will be in the chair.

Royal Dental Hospital

Prizes will be distributed at the hospital on Friday, Oct. 4th, at 8 P.M., at a conversazione at which Sir Francis Acland will preside. The annual clinical At Home will be held at the hospital on Nov. 23rd, and the dinner of past and present students will take place on the same evening at the Trocadero Restaurant, at 7.30 P.M., with Mr. Herbert Smale in the chair.

Further details of post-graduate courses will appear in due course in our *Medical Diary*.

CORRESPONDENCE

VACCINATION ON THE THIRD DAY

To the Editor of THE LANCET

SIR,—*I am writing to draw attention to the harm* which so often results from vaccination during the first three weeks of an infant's life. The infant is struggling, at this time, to adjust itself to its surroundings, and it is only with care and help that a steady gain in weight, and normal adjustment, can be maintained. It has long been the custom to punctuate this trying first month by first a circumcision and then vaccination. The number of infants' lives which have been lost as a result of these two procedures must be very large.

I am informed that it is the custom at one large maternity hospital to vaccinate infants on the third day, as a routine. Baby S. was born at that hospital on August 21st, vaccinated on August 24th, became deeply jaundiced on August 26th and 27th, with an enlarged liver and spleen, and was admitted to Great Ormond-street, under my care, on the tenth day after birth. The child had a fever, a tremendous reaction to the vaccination on the left arm, the stools were unhealthy, and the blood showed a marked hæmolytic anæmia. As the vaccination subsided, the liver and spleen grew smaller, the temperature dropped, and the baby commenced to gain weight.

Surely this pernicious practice of adding to the baby's difficulties deliberately, by such early vaccination, should be widely condemned? Although I am completely in favour of vaccination, I think that three or four weeks of age, in a perfectly normal healthy infant, should be the very earliest time for this, and very often it should be left still later, until the gain in weight is definitely assured and the baby doing well.—I am, Sir, yours faithfully,

DONALD PATERSON.

Devonshire-place, W., Sept. 11th.

PERFORATION OF THE ŒSOPHAGUS BY A SWALLOWED FOREIGN BODY

To the Editor of THE LANCET

SIR,—The following case is of interest in view of the paper on this subject by Mr. John E. G. McGibbon in your last issue.

In July, 1934, a girl of 5 attended with a history of having swallowed a fish-bone four days previously. She had been seen at another hospital immediately after, but nothing was apparently detected or done. Since then there was dysphagia, and the child could not swallow at all on account of the pain and the obstruction. Her head was held rigidly to the left side (as in acute torticollis) with pain on that side of the neck low down, over the cricoid region, where an area of tenderness could be defined. There was no palpable cervical swelling. The patient was coughing up pus and was ill. The temperature was 103° F. On mirror laryngoscopy there was a collection of pus behind and over the larynx. Clinical and radiological examination of the chest was negative. X ray of the œsophagus revealed no foreign body. A bismuth swallow passed down without any hitch.

Under general anæsthesia, preceded by a preliminary premedication with rectal paraldehyde, an endoscopic examination was carried out. The larynx was normal, but fœtid pus welled up from the hypopharynx. There was no retropharyngeal abscess. The œsophagoscope was introduced for about one inch below the cricoid. The pus—fœtid and in large amount—was completely removed. It originated from a retro-œsophageal abscess and entered the œsophagus through a punctured wound, marked by granulations, in the posterior wall. The abscess was emptied by gentle pressure of the beak of the œsophagoscope.

A large rigid spiked fish-bone jutted out for about half an inch, in an antero-posterior direction, from the perforation in the œsophagus. When gripped with forceps it could not be moved, being apparently firmly impacted. The grip on the bone was released. By the time an immediate second attempt was made to grip this bone it had completely disappeared. At this stage no further pus was present in the œsophagus or in the retro-œsophageal abscess. The manipulations lasted 20 minutes.

The sudden and complete disappearance of the bone in view of the impaction was mystifying. It was never traced, though the fæces were examined subsequently. Convalescence was uneventful, and within a week the child left the hospital. When seen about six months later she had remained well.

I am, Sir, yours faithfully,

London, W., Sept. 14th. N. ASHERSON.

BACTERIOLOGY OF RHEUMATISM

To the Editor of THE LANCET

SIR,—Dr. Poynton has inspired all those who learned at his knee with affection and respect, and I would not lightly attempt to detract in the least from his just claim that he and Dr. Paine were the first to grow in pure culture the diplococcus of rheumatism, but in June, 1887 (Brit. Med. Jour., i., 1381), Dr. A. Mantle states:—

> A typical case of acute rheumatism being under his care, under strict aseptic precautions, and by means of a sterilised hypodermic syringe, about a drachm of serum was withdrawn from the knee-joint. Several sterilised tubes of gelatinised meat infusion were at once inoculated and in each tube a copious growth took place. . . . He had found two kinds of bacteria, a micrococcus and a small bacillus. Cover-glass preparations of blood and serum showed micrococci as single cocci or pairs (diplococci).

Dr. Mantle found a variety of organisms in various cases and he figures these in illustrations in this article, but it seems to me that the quotation from his original communication confirms my statement in the Ingleby lecture that Dr. Mantle reported a growth of diplococcus from a case of rheumatism.

I am, Sir, yours faithfully,

Edgbaston, Sept. 11th. K. DOUGLAS WILKINSON.

MALARIA AND RACIAL EXTINCTION

To the Editor of THE LANCET

SIR,—The *Ceylon Observer* of July 6th, under the title "Wiped out by Malaria?" refers at some length to my paper on The Muruts of North Borneo in your issue of May 25th, and to your comment upon it. The *Observer* draws a comparison between the problems of malaria and depopulation in Ceylon and in North Borneo, and concludes that in Ceylon, where conditions are more favourable, there is no danger of the increase in population becoming permanently arrested as a result of the recent malaria epidemic. This view is based to some extent on the theory that primitive races have a tendency to languish. But while this may apply to small isolated tribes, such as tree Negritoes or Sakais, it seems to me unnecessary to invoke such imponderable influences when other factors are so obvious.

In brief but illuminating phrases the *Observer* gives a vivid insight into the terrible results of a mass infection of a non-immune population with virulent strains of malarial parasites:—

> "Appalling . . . ravages. . . . The number of deaths a month has indeed been large enough to justify some of the scare headings in the sensationalist sections of the London Press . . . whole families wiped out and many a village left with no more than a single child in it. . . ."

The Murut tribes of Borneo endured such a saturation infection (the Germans call it *Durchseuchung*) some eight to ten years ago, since when their numbers have progressively declined, until now I doubt if more than 12,000 are left of the 22,000 numbered in the 1931 census. In my opinion they would have suffered far less, and their numbers would have been maintained, had they been spared what is nothing less than quinine deprivation from the very outset of their first new infection. That these unfortunate but trusting and obedient natives should make long journeys in the hope of obtaining vital supplies of quinine and dressings, only to be put off with two or three quinine capsules, a small strip of lint, one-third of a bandage, and a little liniment in the palm of the hand is very pathetic, and it was distressing to have to refuse them an adequate supply of quinine.

The Muruts are interesting to ethnologists, and they are even capable of performing useful labour on estates, when they have received proper treatment for splenomegaly, hookworm, and lesser complaints. Governments would seem to become interested in their aboriginal peoples sometimes only when it is too late to save them, and the Muruts are still going through the stage of being interesting only for revenue purposes. The alternatives to the annual ungraduated cash poll-tax of $1.00—i.e., 2*s.* 4*d.*—for every male adult are (1) payment of a fine of five times the tax, (2) two weeks' rigorous imprisonment, (3) "voluntary" heavy work as coolie bearers for three days, for which they must bring their own food. The imposition of poll-tax on a declining population *must* accelerate the decline. I am, Sir, yours faithfully,

Whiston-street, E., Sept. 9th. A. J. COPELAND.

BILIARY DRAINAGE

To the Editor of THE LANCET

SIR,—I was specially interested in one observation made in the article on biliary drainage by Dr. T. Hunt in THE LANCET of last week. He says that the introduction of magnesium sulphate directly into the duodenum is almost always followed by a flow of bile from the common bile-duct. If this bile is removed by tube there is seldom diarrhœa (the magnesium sulphate presumably remains in the intestines). This observation adds weight to a theory as to the mode of action of magnesium sulphate which I mentioned in THE LANCET of Jan. 26th, and also mentioned by Dr. Hunt last week in his article. I suggested that it depended on the increased flow of bile which follows its administration by mouth.

The purgative action of magnesium sulphate has been proved not to be due to its effect after absorption into the general circulation. It is not due to its osmotic effect because Dr. A. F. Hurst has shown that the watery stool does not contain an excess of sulphate. Also if charcoal is given by mouth a short while before the sulphate the charcoal does *not* appear in the stool which follows. I find that if fresh bile is given by mouth it acts as a strong purgative and preparations of bile salts which are given with the object of causing a greater flow of bile frequently give rise to diarrhœa. Also fresh ox bile given per rectum increases peristalsis in cases of ileus.

These facts suggest that the chief effect of magnesium sulphate may be an increased peristalsis of the large intestine following an increased flow of bile.—I am, Sir, yours faithfully,

D. LINCOLN LEWIS.

Archway Hospital, Highgate, Sept. 17th.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDE SEPT. 7TH, 1935

Notifications.—The following cases of infectiou disease were notified during the week: Small-pox, 0; scarlet fever, 1924; diphtheria, 1003; enteric fever, 85; acute pneumonia (primary or influenzal), 336; puerperal fever, 36; puerperal pyrexia, 131; cerebro-spinal fever, 14; acute poliomyelitis, 18; polio encephalitis, 1; encephalitis lethargica, 8; dysentery 12; ophthalmia neonatorum, 89. No case of cholera, plague, or typhus fever was notified during the week

The number of cases in the Infectious Hospitals of the Londo County Council on Sept. 13th was 2641, which included: Scarle fever, 794; diphtheria, 949; measles, 44; whooping-cough 403; puerperal fever, 32 mothers (plus 13 babies); encephaliti lethargica, 271; poliomyelitis, 14. At St. Margaret's Hospita there were 21 babies (plus 3 mothers) with ophthalmi neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 4 (0) from measles, 2 (0) from scarlet fever, 14 (4) from whooping-cough, 22 (3) from diphtheria, 67 (3 from diarrhœa and enteritis under two years, an 17 (2) from influenza. The figures in parentheses ar *those for London itself.*

Deaths from [illegible] is were distributed ove 28 *great towns* [illegible] ers being *Liverpool* 10, Nottingham 8, [illegible] 5, Manchester 4, Leed and Sunderland [illegible] reat town more than 2 Birmingham rep [illegible] measles. Four cases o diphtheria proved fatal at Manchester, 2 at Bradford.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 45 per 1000 *total births*), including 50 in London.

MEDICAL NEWS

King's College Hospital

The Duke of York has accepted the presidency of King's College Hospital in succession to the Duke of Connaught.

A *Victorian centenary* loan exhibition is being planned for the year 1937 to celebrate the centenary of the accession of Queen Victoria. The exhibition will be mainly illustrative of women's activities during the reign. The proceeds will be given to the hospital, which was founded two years after Queen Victoria's accession.

Society of Apothecaries

Sir William Willcox has been elected the new Master of this society and Mr. A. P. Gibbons and Mr. Hugh Lett Wardens.

Society for the Study of Inebriety

The next meeting of this society will be held in the rooms of the Medical Society of London (11, Chandos-street, London, W.) on Tuesday, Oct. 8th, at 4 P.M., when Dr. Gerald Slot will open a discussion on the medico-legal *aspects of drunkenness.*

Society of Public Analysts

A meeting of this society will be held on Wednesday, Oct. 2nd, at the rooms of the Chemical Society, Burlington House, Piccadilly, London, W., at 8 P.M. The papers *to be read include one on* the chemical examination of furs in relation to dermatitis (identification of vegetable and other dyes) by Mr. H. E. Cox, D.Sc.

Wireless Sets for Hospitals

The King and Queen have given £150 to the fund to equip voluntary *hospitals* in Scotland with wireless sets.

British Red Cross Society

Two courses *of lectures* and demonstrations on anti-gas precautions and first aid for air-raid casualties will be held *at the County of London headquarters* of this society, 9, Chesham-street, S.W., on Fridays, one at 2.30 and another at 8 P.M. from Oct. 4th onwards. Each course consists of seven lectures and demonstrations. Applications for tickets should reach the county secretary of the branch not later than Sept. 28th.

Mr. Wilfred Trotter, F.R.S., will deliver a Lloyd Roberts lecture on General Ideas in Medicine at the Royal Society of Medicine on Monday, Sept. 30th, at 5 P.M.

Charing Cross Hospital

On Thursday, Nov. 28th, at 5 P.M., Prof. Edward Mellanby, F.R.S., will deliver the Huxley lecture in the medical school. Invitations may be obtained on application to the secretary of the school.

Royal Eye Hospital

A research scholarship tenable at this hospital is shortly to be awarded. Preference will be given to a candidate who proposes to undertake research on a clinical subject. Further particulars will be found in our advertisement columns.

Food Poisoning at Swansea

On Thursday of last week a thousand children were entertained to a feast in the Market Hall, Swansea, by the transport company's employees, and more than 150 of these children suffered from acute gastric disturbance, although only one child, a girl of 13, needed hospital treatment. The suspect article of food was fresh minced meat presented by local butchers, samples of which are being examined by the pathologist of Swansea Hospital.

Leeds Public Dispensary and Hospital

A series of post-graduate lectures, open without fee to all members of the medical profession, will be given during the winter. They will be held every Wednesday at 4 P.M. at the dispensary, and the following members of the honorary staff will take part: Mr. A. D. Sharp, Mr. A. Gough, Dr. H. H. Moll, Dr. S. J. Hartfall, Dr. H. G. Garland, Mr. L. N. Pyrah, and Dr. H. B. Pope. Particulars of the course will appear weekly in our Medical Diary.

Mental Health Congress

The fourth biennial conference on mental health arranged by the National Council for Mental Hygiene will be held at the Caxton Hall, Westminster, London, S.W., from Jan. 23rd to 25th, and will be opened by the Duke of Kent. The subjects which will be discussed include mental hygiene and international relations, the organisation and correlation of mental health services in local areas, problems of marriage and the establishment of courts of domestic relations, and the priest and the doctor in the treatment of nervous and mental disorders. The last day will be devoted to a discussion of Education for Living under the following headings: Mental Health; Those First Eight Years; "Moulding" the Mind: Eight to Fourteen; The "Finished" Product: Fourteen Onwards. The secretary of the council may be addressed at 78, Chandos House, Palmer-street, London, S.W.1.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ST. MARY'S HOSPITAL, W.

Friday, Sept. 27th.—10.15 A.M., Dr. D. H. Brinton: Some Common Neurological Problems of General Practice. 11 A.M., Mr. Leslie Williams: Hormone Therapy in Gynæcology. Noon, Dr. A. F. Hurst: Some Functional Disorders of Digestion. 2.15 P.M., Dr. A. Hope Gosse: Electrocardiograms. 3.15 P.M., Mr. R. M. Handfield-Jones: Diagnosis and Treatment of Urinary Calculi. 4.15 P.M., Dr. Duncan Fitzwilliams: The Modern Treatment of Carcinoma of the Breast.

Saturday.—10.15 A.M., Dr. T. C. Hunt: Popular Remedies, New and Old. 11 A.M., Mr. Aleck Bourne: Has Antenatal Care Failed? Noon, Dr. Reginald Miller: Slimming Problems. 2.15 P.M., Mr. V. Zachary Cope: Four Symptoms in Search of an Author. 3.15 P.M., Dr. H. Courtney Gage: X Ray Diagnosis of Organic Lesions of the Alimentary Tract.

Sunday.—10.15 A.M., Mr. A. Dickson Wright: Diagnosis and Treatment of Minor Rectal Condition. 11 A.M., Dr. C. M. Wilson Medical Reasons for Terminating Pregnancy. Noon, Prof. Henry Cohen: Parkinsonism. (Open to all medical practitioners without fee.)

MIDDLESEX HOSPITAL.

Saturday, Sept. 28th.—2.30 P.M., Dr. B. W. Windeyer: Types of Cases Suitable for Radium Therapy. 3.45 P.M., Dr. H. L. Marriott and Dr. A. Kekwick: New Method for Continuous Transfusion of Saline or Blood.

Sunday.—10.15 A.M., Dr. A. A. Moncrieff: Measures for Prevention of Specific Fevers. 11.15 A.M., Mr. D. H. Patey: Recent Advances in Diagnosis and Treatment of Intestinal Obstruction. 12.15 P.M., Mr. R. Affleck Greeves: Treatment of Conjunctivitis and Other Common Eye Conditions. (For former students of the hospital.)

WESTMINSTER HOSPITAL.

Saturday, Sept. 28th.—10 A.M., Mr. A. Tudor Edwards and Dr. W. E. Lloyd: Treatment of Pulmonary Tuberculosis. 11.45 A.M., Dr. R. J. V. Pulvertaft and Dr. N. F. Maclagan: Diabetes.

Sunday.—10.15 A.M., Dr. Adolphe Abrahams: The Physical and Psychological Basis of Disease. 11.15 A.M., Dr. Reginald Lightwood: Some Practical Points in the Diagnosis and Treatment of Disease in Childhood. 12.15 P.M., Mr. Stanford Cade: The Earlier Diagnosis of Accessible Cancer. (Open to all medical practitioners.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Sept. 23rd, to Saturday, Sept. 28th.—Westminster Hospital, S.W. All-day course in medicine and surgery.—Brompton Hospital, S.W. All-day course in chest diseases.—Royal Westminster Ophthalmic Hospital, Broad-street, W.C. Sat. and Sun. course in ophthalmology.—Courses are open only to members and associates of the Fellowship.

ROYAL INFIRMARY, MANCHESTER.

Tuesday, Sept. 24th.—4.15 P.M., Dr. Charles S. D. Don: High Blood Pressure.

Friday.—4.15 P.M., Mr. D. L. Sewell: Demonstration of Malignant Disease of the Nose and Throat treated by Radium.

Births, Marriages, and Deaths

BIRTHS

Mitchell.—On Sept. 9th, the wife of S. F. Mitchell, M.R.C.S. Eng., of Beckley, Sussex, of a daughter.

Muir.—On Sept. 17th, at Hull, the wife of David Clark Muir, M.D., F.R.C.P., of a son.

Oakden.—On Sept. 8th, at Cambridge, the wife of G. F. Oakden, M.B. Camb., of a daughter.

Robinson.—On Sept. 9th, at Kingston-on-Thames, the wife of R. D. Robinson, M.B. Lond., of a son.

MARRIAGES

Beattie—Baddeley.—On Sept. 11th, at Reigate, William John Hunt Montgomery Beattie, M.D. Camb., F.R.C.S. Eng., to Marjorie Gertrude, only daughter of Mr. Bernard Baddeley, Reigate Heath, Surrey.

Braithwaite—Fawcett.—On Sept. 7th, at St. George's, Campden Hill, Edward Braithwaite, B.M. Oxf., of Egremont, Cumberland, to Barbara Fawcett, of Cawsand, Devon.

Goldsmith—Oliver.—On Sept. 9th, at Wood Green Congregational Church, Edward J. Goldsmith, M.R.C.S. Eng., of Allestree, near Derby, to Ivy E. Oliver, M.R.C.S. Eng., of Wood Green, London.

Gurney—Moule.—On Sept. 10th, at St. Peter's Church, Limpsfield, Theodore Ronald Valpy Gurney, M.B. Brist., to Agnes Mary Riddell, only daughter of Mr. and Mrs. W. Moule, of Brighton.

Holgate—Gamon.—On Sept. 11th, at Halton, Albert William Holgate, M.S. Lond., F.R.C.S. Eng., of Chester, to Monica Taylor Gamon, of Halton, Cheshire.

Marshall—De Mierre.—On Sept. 10th, at Hellingly Parish Church, Sussex, George Hay Marshall, F.R.C.S. Edin., to Helen Mary (Jill), second daughter of Mr. A. De Mierre, of Hellingly.

Matthew—Cound.—On Sept. 7th, at St. Theodore's Church, Port Talbot, Patrick Crichton Matthew, M.R.C.S. Eng., to Catherine, youngest daughter of the late Mr. Alfred Cound and Mrs. Cound, Port Talbot.

GOLDEN WEDDING

Fortescue Fox—McDougall.—On Sept. 16th, 1885, at the Jameston Church, Strathpeffer, by the Rev. James Calder McPhail, D.D., Pilrig, Edinburgh, Robert Fortescue Fox, M.D., seventh son of Joseph John Fox, Surgeon, of Stoke Newington, to Katharine Stewart McDougall, daughter of the Rev. W. S. McDougall, Strathpeffer.

DEATHS

Duncan.—On Sept. 15th, at Afton, Woking, William Duncan, O.B.E., M.B. Glasg., a senior medical officer of the Ministry of Health.

Edginton.—On Sept. 12th, at Walton St. Mary, Clevedon, Somerset, Robert William Edginton, M.D. Brux., M.R.C.S. Eng., aged 85.

MacBean Ross.—On Sept. 16th, at Portsmouth, Donald Charles, dearly beloved elder son of Doctor and Mrs. J. N. MacBean Ross, of Lauriston, Sutton, Surrey.

McMaster.—On Sept. 8th, suddenly, at 7, Forestdale, Southgate, London, N.10, Archibald Cotterell McMaster, M.D., F.R.C.S. Edin., late of Rugby.

Richards.—On Sept. 12th, suddenly, at Odiham, Hants, Robert Richards, L.R.C.P.I., L.R.C.S. Edin., aged 72.

Winslow.—On Sept. 8th, at North Stoke Mill, Oxford, Walter Winslow, M.B., B.Chir. Camb.

Worthington.—On Sept. 14th, at Warwick, Sidney Worthington, M.D. Lond., F.R.C.S. Eng., aged 76 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

A PROPOSED NATIONAL OXYGEN TENT SERVICE

THE British Red Cross Society has received the following memorandum from members of the staff of all the London teaching hospitals:—

"We who have signed this letter are convinced that the oxygen tent provides the most efficient means of administering oxygen so far devised, and is of great value in a number of medical and surgical conditions. We should welcome any steps to make the method more readily available in hospitals and in the patient's own home. We believe that any help the British Red Cross Society can give in this connexion will be for the public welfare."

The signatories to this memorandum are Lord Dawson of Penn (London), Lord Horder and Sir Thomas Dunhill (St. Bartholomew's), G. E. Beaumont and R. A. Young (Middlesex), A. Tudor Edwards (Westminster), Douglas Firth (King's College Hospital), Francis R. Fraser (Postgraduate Medical School, Hammersmith Hospital), Reginald Hilton (St. Thomas's), Gordon Holmes (Charing Cross), Arthur F. Hurst and E. P. Poulton (Guy's), Cecil A. Joll (Royal Free), Reginald Miller (St. Mary's), Wilfred J. Pearson (University College Hospital), and James Torrens (St. George's).

The British Red Cross Society has decided to respond to this memorandum by coöperating in the establishment of a national oxygen tent service should it be found that there is need for such a service. Before embarking on a complete scheme, which would involve considerable expense, the society desires to collect more definite data than is at present available on the value of the apparatus in various conditions. In order to obtain this evidence the society has placed an order for the construction of twelve sets of apparatus, which will probably be completed before the end of October. One tent will then be placed at the disposal of each of the hospitals to which the signatories to the memorandum are attached (except the Hammersmith Hospital which already has one), the initial cost being met out of the funds of the society.

The hospitals have been asked whether they are willing to accept one of the tents for trial over a period of not less than two months, keeping comprehensive records of the cases for which it has been used, and furnishing a report at the end of the period on the value and desirability of a national service. If at the end of the trial any hospital wishes to acquire the apparatus it can do so on refunding the cost of the tent to the society.

As some instruction is desirable as to the operation of the apparatus, a model will be at the house of the British Red Cross Society, 14, Grosvenor-crescent, London, S.W.1, and will be available for demonstration to members of the staff of the hospitals by appointment after Oct. 1st.

The bed tent for administering oxygen and carbon dioxide, described by Dr. E. P. Poulton and illustrated in our columns two years ago (see THE LANCET, 1933, i., 245), has since been modified in important details. It has been found possible to abandon the cumbersome extension ladders on either side of the bed, with the crossbar from which the tent was suspended. The modern tent is built on an adaptable frame and can be raised or lowered by means of a handle behind the bed. The provisions for keeping the patient under full observation through non-inflammable celluloid windows, and for keeping him dry and cool, have also been improved. It seems likely that the hospitals concerned will gratefully accept the offer of the British Red Cross Society. If the verdict is favourable, the next step may be the organisation of a hire service for oxygen tents under the auspices of the society.

REGIUS CHAIR OF PHYSIC AT CAMBRIDGE

A CORRESPONDENT writes: "Your note on the appointment as the twenty-first regius professor of physic at Cambridge of Dr. John Ryle, physician to Guy's Hospital, raises some points of interest. The chair was founded in 1540, and until 1892, when Sir Clifford Allbutt was appointed, had almost always been occupied by a local physician resident in Cambridge. Before Allbutt's appointment, Sir Andrew Clark, then president of the Royal College of Physicians of London and also of the Royal Medical and Chirurgical Society, was asked by some members of the medical faculty at Cambridge if he would accept the chair, but he declined. So although Dr. Ryle is the first regius professor not a Cambridge man by education, the idea of introducing such entirely fresh blood is more than forty years old. Under the new statutes all Cambridge professors appointed after Oct. 1st, 1924, vacate their office and automatically become Emeritus professors at the end of the academic year in which they attain the age of 65 years. Before this change was insti tuted by the Royal Commission, the only limit was that of life, and 5 of the 18 professors of physi under the old statutes remained in office when 80 or more years had passed over their heads; one indeed was 90, and Sir Clifford Allbutt, who neve grew old in mind, was 89 years of age. Two professor with tenures of 52 and 41 years practicall monopolised the whole of the eighteenth century.

"On the other hand, two others—the second John Hatcher, and the ninth, Ralph Winterton—held the chair for one year only. It was he wh as a mathematician had suffered from sleeplessness an melancholia and consulted the then regius professo of physic, Dr. John Collins; this professor advise him to give up mathematics and to study medicin assuring him that he might thus erase from h mind the recollection of past ills. 'I did,' sai Winterton in the preface to one of his books, 'as h advised, and what he foretold took place.' Winterto was a most eminent scholar, but unfortunately di in his thirty-seventh year in 1636. His successor w far the most distinguished occupant of the cha before the nineteenth century—namely, Franc Glisson, anatomist, physiologist, pathologist, phys cian, pioneer in orthopædics, and philosopher. I was in the regius chair for the remaining 31 yea of his life, but was much of an absentee first duri the Civil War when he practised at Colchester wi great success, and also, but especially later, London where he held many offices, including th of president, at the Royal College of Physicia of president, at the Royal College of Physicia was one of the original Fellows of the Royal Societ and did yeoman's service during the great plag He probably also found the intensely Royali atmosphere at Cambridge distasteful. Caius, senior, was also president of the college, but n regius professor; both of them died in London.

"The posts of regius professor of physic and th of regius professor of medicine at the senior universi are high in honour, ranking next to the usual more temporary presidents of the two Royal Colleg It is fortunate to be able to fill such a post und the new conditions with one who is in every w eligible and is also young enough to have the prosp of holding it for a considerable period. With popular medical school of 500 students engaged pre-clinical work under the best possible conditio the possibility of the Cambridge School ever becomi 'complete'—namely, supplying clinical facilities a satisfactory character to all these students—is mo remote than ever from practical politics. Half century ago teachers in all the clinical subjects w appointed, and the ambitious plan of a compl medical school was more than a dream at any r to the first-named of the great triumvirate— George Humphry, Sir George Paget, and Sir Mich oster—to whom the medical school is so largely debted for its present efficiency and fame.

“Cambridge is the home of research, and realisation f the need for an adequate department there of linical science with facilities for research is not ew; Oxford has been more fortunate in being able o set this example to the younger university. The dvantages of a scheme whereby young medical raduates could carry out investigation on clinical roblems in selected cases under the guidance of an ctive director and in close touch with the fine boratories of anatomy, physiology, biochemistry, nd pathology are too obvious to justify more rgument; but there is thus an opportunity for a ell-advised benefactor to set going a department hich should fully show the great value of such enerosity.

“The new regius professor is imbued with the raditions of Guy's Hospital, and the example of ddison, Bright, and Hodgkin and many others; ndeed it is perhaps remarkable, and certainly a ropitious omen, that there is now for the first time his link between that great hospital and the ambridge medical school.”

SOME HOSPITAL PHARMACOPŒIAS

THE introduction of the B.P. 1932 has necessitated the revision of many hospital pharmacopœias and ther publications concerned chiefly with official rugs. Three such pharmacopœias are those of King's College, St. Mary's, and Westminster Hospitals, all of which have been brought up to date and issued as 1934 editions. There are many features in common and numerous familiar formulæ are included in each, but it is interesting to note certain individual tastes in prescribing.

At King's there is a cataplasma carbonis, consisting of crushed linseed and wood charcoal; morphine acetate, a relatively unstable salt of morphine, is retained in *Collut. Morphinæ;* ergotamine tartrate is prescribed as an injection which is given the name of *Injectio Ergotæ;* chiretta is used as the bitter in *Mist. Acid. Hydrochlor.;* Unna's paste contains 2 per cent. of ichthammol; pills are featured and only two formulæ for tablets are given.

At St. Mary's we find *Gutt. Duboisin. Sulphat.*, *Inj. Lithii Salicyl.* for varicose veins and, although liquid extract of ergot, B.P. 1932, gives an unsightly deposit on admixture with water, formulæ are given for *Mist. Ergot. Acid.* and *Mist. Ergot. Alk.* Chloramine T is used in the preparation of *Inj. Chloraminæ*, a preparation much superior to the hypochlorite solutions on account of its stability. In the list of proprietary preparations two mistakes call for comment. Radiostoleum (it should be Radiostol) is given as the synonym for *Liq. Ergosterol. Irradiat.*, and a more serious mistake is Medinal for soluble phenobarbitone, instead of soluble barbitone.

Westminster has a number of medicated papers—e.g., *Charta Potass. Nitrat.* *Enema Rutæ* is retained and an unusual mixture in the children's formulary is *Mist. Ichthammolis.* This pharmacopœia shows evidence of improved formulæ in the introduction of elix. cascaræ in *Mist. Casc. Sagr.*, the use of light liquid paraffin in the preparation of nebulæ, and physostigmine salicylate in *Gutt. Physostigm.*

All three of these hospital pharmacopœias contain data and tables of value to the hospital student and the practitioner.

CHILD DEVELOPMENT

AN ambitious attempt to portray the development of the child from its earliest infancy to full adult growth which, she assumes, is reached at the early age of 17 years, has recently been published by Prof. Charlotte Bühler.[1] She has tried by means of direct observation and experiment to evaluate the development of traits in the intellectual, emotional, and social spheres. We have every sympathy with the desire to obtain more definite estimates of the normal evolution of children, while hesitating to accept any estimate based on such figures as are here presented. The collection of cases from which conclusions are drawn is inadequate and the generalisations made do not bear scrutiny. Dr. Bühler does not give all the figures on which she bases her statements; but we quote two which she does mention to show how narrow is the viewpoint from which she has worked. The first is the estimate of the reactions of very young infants: “the cross-section was arrived at by studying five healthy children for each month of the first year for one day and one night.” At the other end of the scale her estimate of the characterological constants of children is based on a study of only 20 families, and by means of the visits of a psychologist to a family twice a week for one to two hours, with a subsequent “write up” of impressions, it being tacitly assumed that the reactions of the family were normal in the presence of the guest. Dr. Bühler apparently has little use for the psychological tests accepted in this country, the revised Terman, the Binet-Simon, the Merrill-Palmer, the Gesell tests, because they are designed to test only intellectual ability. This is certainly not true of the Gesell and Merrill-Palmer tests, and in any case if Dr. Bühler had studied some of the psychological reports submitted in the child guidance clinics in this country she would have found the formal report of the estimated I.Q. almost invariably accompanied by a comment on those emotional and social reactions of the child which might modify the intelligence estimate. Incidentally all the accepted tests are based on groups of more than 600 cases, and have been revised and adapted to fit the particular types of children for whom they are used, so that inaccuracies dependent on such factors as race or environment may be eliminated. Apart from the unsatisfactory figures on which the conclusions are based, some of the experiments described by Dr. Bühler are open to objection in themselves. To test a child's social responses and body control at the age of 6 months by making an “angry expression” at it to see if it will react, or by covering its head with a diaper to see if it will remove it, are measures which one would expect to produce not normal but rather fear reactions. There are other features of the book which detract from its value as a serious contribution to the study of child psychology.

Dr. Susan Isaacs's pamphlet[2] belongs to an entirely different category. In it she sets out clearly the broad lines of child development, laying stress on the number of aspects from which it needs to be studied if satisfactory conclusions are to be drawn. While insisting on the importance of the biological background, she claims with justice that any attempt to understand the development of the human child in terms of crude biological returns which overlook his early social relations is quite misleading. Dr. Isaacs's little book should be of value not only to the child psychologist but also to teachers and other educational workers. An interesting feature is her reference to the importance of affective influences in deflecting the whole course of intellectual development and the possibility of psychotic mechanisms producing the appearance of mental defect. Of especial value, too, is the exposition of the stages of maturation of intelligence and the phases of development at which children learn most easily things intellectual and practical. The psychologist will find useful the summary of the methods by which Dr. Isaacs considers psychological data can best be collected: observation, incidental and experimental; experiment, including direct measurement of simple functions and intelligence tests; developmental schedules of age-groups; and psycho-analysis of children. Throughout, the point of view is objective. The pamphlet is intended as a basis of study; it is accompanied by a useful little bibliography and contains unbiased accounts of a wide variety of methods. In the more detailed description of normal and abnormal traits which follows, a brief description of each is given, with the ages at which it most commonly occurs. All this is very suggestive and is allowed to remain so, no attempt being made to regard hypotheses as scientifically tested facts or to base statistics on a small number of cases. The pamphlet concludes with a plea for skilled and sympathetic workers in education and psychology.

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[1] From Birth to Maturity. By Charlotte Bühler, Professor at the University of Vienna. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1935. Pp. 237. 7s. 6d.

[2] The Psychological Aspects of Child Development. By Susan Isaacs, M.A., D.Sc., Head of Department of Child Development, University of London Institute of Education; Psychologist to the London Clinic of Psycho-analysis. London: Evans Brothers Ltd. 1935. Pp. 45. 1s. 6d.

Doctors, Chemists, and Population.—The *Pharmaceutical Journal* of Sept. 7th has taken the trouble to work out the proportion of pharmacists and doctors to population in this country. The years chosen are those of the decennial census and the area chosen is not quite the same in the two groups, being Great Britain for the pharmacists and the British Isles for the doctors.

Year.	Pharmacist.	Doctor.
1911	2495	1109
1921	2307	1038
1931	2053	881

Hygienic Caps for Milk Bottles.—The metal cap now being used by United Dairies Ltd. for its milk bottles completely covers the pouring edge of the bottle. In the old type of bottle sealed with a pasteboard disc it was possible for dirt to collect on the disc and on the pouring edge of the bottle. The new cap eliminates this risk, and has the further advantage that it can be replaced as a cover after the bottle has been opened.

The "Annual Review of Biochemistry," mentioned on p. 617 of our last issue, can be obtained from Messrs. H. K. Lewis and Co., Ltd., for 22*s.* 6*d.*

Appointments

Allen, Geoffrey, M.B., has been appointed Hon. Pathologist to the South-Eastern Hospital for Children, London.

Bannerman, R. G., M.D. Edin., Non-resident Pathologist to the Peterborough and District Memorial Hospital.

Dunn, B. Venn, M.D., F.R.C.S. Edin., Hon. Surgeon in charge of Out-patients to the Torbay Hospital, Torquay.

Forbes, Jean, M.B., Junior Resident Medical Officer at the Manchester Babies' Hospital.

Gross, D. M. B., M.D. Leeds, D.P.H., Assistant Medical Officer of Health, Ilford.

Weir, J. H., M.D. Durh., B. Hy., D.P.H., Assistant Medical Officer of Health, Ilford.

Wilson, W. Etherington, F.R.C.S. Eng., Hon. Surgeon to the Torbay Hospital, Torquay.

Wright, A. B. B., M.B. Glasg., Senior Resident Medical Officer at the Manchester Babies' Hospital.

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Hospital for Sick Children.—Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.

Aberdeen Royal Infirmary.—Hon. Jun. Asst. Surgeon to Ear, Nose, and Throat Dept.

Altrincham General Hospital.—Sen. and Jun. H.S.'s. £150 and £120 respectively.

Barbados General Hospital.—Jun. Res. Surgeon. £325.

Birmingham City.—Asst. M.O. £550.

Birmingham, West Heath Sanatorium.—Res. Asst. M.O. At rate of £250.

Birmingham and Midland Eye Hospital.—H.S. At rate of £130.

Bolton Royal Infirmary.—H.S. £125.

Bradford Royal Eye and Ear Hospital.—H.S. £160.

Brighton, Royal Sussex County Hospital.—H.S. £150.

Central Middlesex County Hospital.—Med. Supt. £1300.

Chelmsford and Essex Hospital.—H.P. and H.S. Each at rate of £150.

Chester County Mental Hospital.—Jun. Asst. M.O. £350.

Coventry and Warwickshire Hospital.—Res. H.S. Also Cas. O. Each £125.

Derbyshire County Sanatorium.—Jun. Res. Asst. M.O. £350.

Eastbourne, Princess Alice Memorial Hospital.—Res. £150.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.S. Spec. Depts. and Cas. O. At rate of £120.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W Surg. Reg. £100.

Essex County Council, Public Assistance Dept.—District 11 gns. per week.

Evelina Hospital for Sick Children, Southwark, S.E.—H.P. rate of £120.

Glasgow Corporation, Police Dept.—Physician to the £1250.

Glasgow, Woodilee Mental Hospital, Lenzi.—Jun. Asst. £300.

Halifax Royal Infirmary.—Res. Surg. O. At rate of £250.

Hertford County Hospital.—H.S. At rate of £180.

Hospital for Consumption and Diseases of the Chest, *S.W.*—Res. Surg. O. and Asst. Res. M.O. Each at of £150. Also H.P.'s. Each at rate of £50.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. Supt. £300. Asst. M.O. £300. Also Out-patient Reg. £250.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Res. H.S. At rate of £75.

Huddersfield Royal Infirmary.—H.S., H.P., and Res. thetist. Each at rate of £150.

Ipswich, East Suffolk and Ipswich Hospital.—Consult Physician.

L.C.C.—Asst. M.O. for White Oak Hospital, Swanley.

L.C.C.—Jun. M.O.'s. Each £7 a week.

Leicester Royal Infirmary.—Jun. Res. Anæsthetist. At rate £150. Also Sen. Cas. O. £125.

Lincoln, Bracebridge Mental Hospital.—Jun. M.O. £350.

London Jewish Hospital, Stepney Green, E.—Second Hon. Ophth. Surgeon.

Maidstone, Kent County Mental Hospital.—Asst. M.O.

Manchester, Ancoats Hospital.—H.S. for General and H.S. Ear, Nose, and Throat Dept. At rate of £100.

Manor House Hospital, Golders Green, N.W.—Jun. M.O.

Mansfield and District Hospital.—Hon. Ophth. Surgeon.

Mansfield, Harlow Wood Orthopædic Hospital.—Two H.S. Each at rate of £200.

Margate and District General Hospital.—Res. M.O. £150.

Middlesbrough Education Committee.—Sen. Asst. School £500.

Middlesbrough, North Ormesby Hospital.—Hon. Orthop Surgeon.

Middlesbrough, North Riding Infirmary.—Third H.S. £125.

Nelson Hospital, Merton, S.W.—Res. H.S. At rate of

New Zealand, University of Otago and Dunedin Hospital. Sen. Res. M.O. £500.

North Riding of Yorkshire County Council, &c.—Two M.O.H. Each £800.

Norwich, Jenny Lind Hospital for Children.—Res. M.O.

Nottingham General Dispensary, Gregory Boulevard Branch. Res. Surgeon. £250.

Nottingham General Hospital.—H.S. for Ear, Nose, and Dept. At rate of £150.

Nottingham Hospital for Women.—H.S. At rate of £150.

Nottingham and Midland Eye Infirmary.—Hon. Asst.

Oldham Royal Infirmary.—Cas. O. and H.P. At rate of £175.

Paddington Green Children's Hospital, W.—H.P. and Each £150.

Queen Mary's Hospital for the East End, E.—Asst. £400.

Queen's Hospital for Children, Hackney-road, E.—H.P. Cas. O. Each at rate of £100. Also Asst. Physician.

Richmond Royal Hospital.—Jun. H.S. At rate of £100.

Rochdale County Borough.—Jun. Res. M.O. for Birch Hospital. At rate of £225.

Royal Eye Hospital, Med. School, St. George's-circus, S.E. Research Scholarship. £100.

Royal Free Hospital, Gray's Inn-road, W.C.—Res. Reg. £100. Also Res. Cas. O. At rate of £150.

Royal Masonic Hospital, Ravenscourt Park, W.—Res. Surg. At rate of £250.

Royal National Orthopædic Hospital, Great Portland-st., W. Two Registrars Each £105.

St. Mary's Hospital, W.—Surg. Reg. £200. Also Reg. and Jun. Clin. Asst. for X Ray Dept. Each £50.

St. Mary's Hospital for Women and Children, Plaistow, E. Resident and Asst. Res. M.O.'s. At rate of £175 £120 respectively.

Samaritan Free Hospital for Women, Marylebone-road, N.W. H.S. At rate of £100.

Sheffield, Jessop Hospital for Women.—Two H.S.'s. Each rate of £100. Also Hon. Surgeon.

Sheffield Royal Infirmary.—Clin. Asst. for Dept. £300.

Southend Municipal Hospital.—Two Asst. M.O.'s. Each

Southend-on-Sea General Hospital.—Pathologist. £600. £100. Also Hon. Visiting General Physician and

Swansea General and Eye Hospital.—H.P. Also H.S. at rate of £150.

Torquay, Torbay Hospital.—H.S. £175.

Wigan, Royal Albert Edward Infirmary, &c.—H.S. At of £150.

Durham County Hospital.—This institution, which almost all the miners contribute, is in need considerable extension. Many more serious cases for admission than can be accommodated. The patients' department is also badly overcrowded. year the expenditure of the hospital exceeded its by over £2000.

ADDRESSES AND ORIGINAL ARTICLES

THE NEUROTROPIC VIRUS DISEASES*

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I

THOUGH Pasteur in his work on rabies discovered the first perfectly typical neurotropic virus as long ago as 1884, and poliomyelitis was shown to be due to a neurotropic virus in 1909, it is of recent years that our knowledge of the subject under consideration has grown by leaps and bounds; to-day neurotropic viruses are being found to play an ætiological rôle in an increasing number of nervous diseases. The world-wide epidemic of encephalitis lethargica at the end of the last European war was due almost certainly to the action of a virus; though conclusive experimental proof has never been forthcoming—possibly because the disease is transmissible to only one animal, man—all the indications point in this direction. Herpes zoster again is probably excited by a virus. Poliomyelitis is transmissible experimentally to only one group of animals other than man—viz., the monkeys and apes—and among these the New World monkeys are insusceptible; were this virus only a little more selective in its pathogenic activities, our knowledge of the causation of infantile paralysis would be exactly comparable with that of encephalitis lethargica and herpes zoster.

Of late many new neurotropic viruses affecting man and animals have been isolated, and it is quite clear that the discovery of others awaits only the application of the experimental method to cases of hitherto obscure nervous illness. For instance, in 1932 a research worker in New York was bitten slightly by an apparently healthy monkey. A vesicular lesion, accompanied by some lymphangitis, appeared at the site of trauma. Thirteen days later he developed an ascending myelitis, to which he succumbed on the 18th day; from the brain and cord a new neurotropic virus was obtained.[1] In 1933 an outbreak of encephalitis in St. Louis and Kansas City, Missouri, yielded yet another neurotropic virus.[2] In short, the subject of neurotropic viruses is to-day one of the actively advancing wavelets on the tide of medical science.

The Lesions and Their Distribution

Clinically, the activity of these viruses finds expression in symptoms of encephalitis or myelitis, according as the brunt of the attack is borne by a higher or lower level of the nervous system. In the great majority of cases, however, pathological examination reveals participation of all parts of the central nervous system, so that the term encephalomyelitis would seem a more appropriate one. For example, in poliomyelitis, in which commonly the chief symptoms are those of affection of the anterior-horn cells of the spinal cord, there are almost always to be found at autopsy slighter pathological changes in higher regions such as the brain-stem, basal ganglia, and motor cortex, as well as in the spinal ganglia and peripheral nerves. Recent observers suggest that such lesions may have an important influence on the symptomatology in the preparalytic stages of the disease, though later they are completely overshadowed by the destruction of lower motor neurons.

From the multiplicity of known neurotropic viruses it follows that encephalitis or encephalomyelitis is not one malady; in addition to the toxic and bacterial causes of brain and cord disease, there are many viruses capable of attacking the nervous system, and of producing a more or less characteristic clinical syndrome depending on whether they have largely a selective action on a particular region or are fairly diffuse in their activities. And these various forms of virus encephalomyelitis bear no closer relation one to another than does small-pox to measles.

The clinical features of the various maladies and the serious problem of therapy can be considered rationally only in the light of modern researches in pathology and pathogenesis. Our conception of the importance of the various histological phenomena has altered radically of recent years. We believe to-day that the perivascular infiltration and meningitis so prominent in human cases, in which examination must necessarily be deferred until a late stage of the disease, represent in many cases merely the reaction of these tissues to damage to the essential nervous structures. The great majority of neurotropic viruses directly attack and destroy the nerve-cells, whatever effect they may have on the vessels and meninges. In the earliest stages of many diseases in animals, the nerve-cells are already severely damaged before inflammatory signs make their appearance. In the later stages, inflammatory œdema and exudate may play a part in hindering the nutrition of the already affected neurons, and thus decrease their chances of recovery. But in contradiction to the classical accounts of, say, poliomyelitis, which picture the morbid process as beginning in the meninges and spreading thence along the vessels to attack the anterior-horn nerve-cells, I must stress the primary and severe involvement of the neurons. From the theoretical point of view we might expect this, for the viruses are eminently cytotropic organisms parasitising and growing in cells, and the very fact that some are strictly neurotropic indicates their lack of affinity for cells other than the neurons. From the practical standpoint recognition of this fact is fundamental, for nerve-cells do not multiply in extra-uterine life, and a cell once destroyed can never be replaced; the most that can be hoped is that other similar cells may assume its function.

The lesions due to neurotropic viruses are, then, more marked in the grey than the white matter of the brain and spinal cord. The nerve-cells undergo various kinds of degeneration. With viruses of low virulence the changes are probably not irreversible, and recovery of many of the neurons may follow. With viruses of extreme virulence the nerve-cells suffer acute necrosis, and are later engulfed and removed by phagocytic cells in the process of neuronophagia. If in such a case death does not result from involvement of the vital centres, or from secondary pneumonia or urinary sepsis, the patient is left with a loss which no drugs or mechanical treatment can do more than palliate. Coincidentally with, or immediately following the nerve-cell degeneration, inflammatory exudate appears in the tissues, perivascular sheaths and meninges, and may in subacute conditions attain such proportions that in the past it has been accepted as the primary lesion. A point worthy of emphasis is that these neurotropic viruses are not responsible for direct damage to the myelin sheaths; when nerve-cells are destroyed the usual myelin degeneration of Wallerian type ensues in the corresponding nerves and tracts, but a primary attack on the myelin is characteristic of quite another type of encephalitis to which reference will be made later.

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* Abbreviated from the William Withering lectures in the University of Birmingham, 1935. Lect. II. will appear next week.

Paths of Infection

Concerning the path by which these viruses reach the nerve-cells I shall have to confine my remarks to a few dogmatic statements. Poliomyelitis and rabies viruses are almost never found in either blood or cerebro-spinal fluid; the few positive results recorded have been obtained during the period of the declared disease, and hence are of no importance in indicating by which route the virus travelled during the incubation period. Other viruses, for instance that of pseudorabies, do occur in the blood, but it can be proved that they do not reach the nervous system by its agency.[3] On the other hand, it is known that poliomyelitis and rabies viruses do not reach the brain or cord if the nerves supplying the part inoculated are sectioned, showing that the virus travels by some anatomical component of the nerve trunk. After inoculation of poliomyelitis virus into the *left* sciatic nerve, virus and lesions first appear in the lumbar cord and next in the leg area of the *right* motor cortex.[4] Remembering that the pyramidal tract decussates in the medulla, it seems that the structure transmitting the virus in this case must be the nerve fibre itself. Further evidence has been furnished by transection of the cord and subsequent intracranial inoculation of virus, when virus and lesions are found only in that part of the cord above the point of section, though the segments below are still bathed with cerebro-spinal fluid and their blood-supply is intact.[5]

How then does the neurotropic virus reach the central nervous system in the case of natural infection? In rabies, of course, the virus is introduced by the bite of a rabid animal. In pseudorabies the virus probably enters in a similar way through a crack or abrasion in the skin or mucous membranes. In both cases the virus then infects the local nerve-endings and passes up the corresponding peripheral nerve to the cord. Probably, however, the usual route of entry of the neurotropic viruses is by the nose. The intranasal method of infection, by instilling drops of infective material into the nares of animals, is one attended experimentally by a considerable measure of success, even though it avoids all trauma which might be expected to facilitate the establishment of the virus. In the case of poliomyelitis it has proved possible by rather unusual experimental measures to infect monkeys by the gastro-intestinal route, but there is no proof that this is the route of invasion under natural circumstances. A few observers believe that the greater frequency of paralysis in the legs than in the arms or bulbar muscles is indicative of intestinal infection via the splanchnic nerves, but against this view must be set the observation that whatever the route of infection the legs are very frequently first and most affected. No, the evidence available is strongly in favour of an entry under natural conditions by the nose, and perhaps in cases of the bulbar form of the disease by the tonsils or nasopharynx. For a virus which has affinity only for nervous tissue, the nose constitutes a peculiarly convenient portal of entry. The terminal fibrils of the olfactory nerve are directly exposed on the surface of the olfactory mucosa, and after a short extracranial course pass through the cribriform plate to deliver the virus directly into the susceptible nervous system. The implications of these findings are far-reaching. If the results of animal experimentation can be applied to human pathology, poliomyelitis is from the first a primary disease of the nerve-cell, and there is no systemic or blood phase of infection during which liberal treatment of the patient with antiserum can prevent the virus from reaching the nervous system.

The foregoing account has not taken into consideration a small group of viruses which behave in quite a different manner and which I should mention for the sake of completeness. The only examples we know at present are the viruses of louping-ill, equine *encephalomyelitis*, and yellow fever. They are all transmitted by the bite of a blood-sucking insect and they all circulate in the blood: the nervous infection is intimately connected in a manner yet unexplained with their presence in the blood stream, and they do not ascend by the peripheral nerves. In the case of the unmodified yellow fever virus the neurotropic affinities are masked by the stronger viscerotropic action, but passage of the virus from brain to brain in mice is effective in revealing its neurotropic potentialities.

Clinical Differences between Virus Diseases

Now neurological symptoms and signs are determined in great part by the particular nervous structures involved, and by the tempo of the destructive process. Morbid processes of quite different nature may give rise to much the same symptoms. Localisation of a focal lesion depends solely on an accurate knowledge of anatomy, while diagnosis of the nature of the lesion is a much more difficult proposition. Since we have in so many cases a clinical syndrome characteristic of a particular virus disease, it follows that the symptomatology depends on one or two factors; either it is influenced by the portal of entry of the virus, and this must vary in the different infections, or the virus has a special predilection for certain areas of the brain or cord. It is possible to choose examples illustrating the operation of either of these factors. Intracerebral inoculation in the rabbit of the recently isolated B virus[1] leads to manifestations of encephalitis—hyperexcitability, convulsions, and speedy death. If, however, the virus is inoculated intramuscularly or intracutaneously, the invasion of the cord by way of the corresponding peripheral nerve sets up an ascending myelitis, which only after several days involves the vital centres of the medulla and thus in all respects copies the condition in man. Here the portal of entry of the virus is all-important in determining the symptomatology; presumably this virus has equal affinity for all parts of the central nervous system, and the clinical course depends on which level is first attacked. On the other hand, whatever their route of entry, certain viruses have a remarkably selective action on certain types of nerve-cell. Thus the main attack of poliomyelitis virus is on the anterior-horn cells of the spinal cord, that of louping-ill in the monkey on the Purkinje cells of the cerebellum, that of pseudorabies in the monkey on certain parts of the cortex near the temporal pole and the calloso-marginal fissure. The site of election of Negri bodies in the cornu Ammonis in rabies possibly represents higher resistance of a certain type of nerve-cell to the virus. It must not be concluded that in the cases quoted no damage occurs elsewhere; indeed I have already emphasised the diffuse distribution of the lesions due to almost all neurotropic viruses. But while in, shall we say, louping-ill, practically every Purkinje cell of the cerebellum is usually destroyed, in the cortex, basal ganglia, brain-stem, and cord only a small and variable proportion of neurons suffer the most severe changes, with the result that the symptoms are dominantly cerebellar. In contrast we may consider the protean symptoms of the acute stages of encephalitis lethargica to be due to the variable distribution of the most severe lesions, though even here certain symptoms recurred in a considerable percentage of cases.

We are now in a position to consider individually some of the commoner neurotropic virus diseases, and perhaps first of all poliomyelitis claims attention.

Poliomyelitis

Many practitioners still think of poliomyelitis as a disease characterised chiefly by a more or less extensive, flaccid paralysis of sudden onset, often persisting as a permanent disability. But this is not the complete picture of the malady as we know it to-day. Poliomyelitis is a disease probably affecting a very large proportion of the community—at least of the urban community; it is only occasional cases, estimated by some at less than 1 per cent. of the total infected, which develop paralysis and are diagnosed as such. Where investigations have been made it has commonly been found that 50–80 per cent. of the adolescent and adult population carry neutralising antibodies in the serum, and with very few dissentients bacteriologists believe that this is certain evidence of previous infection. If this view is correct, we must assume that in these cases symptoms of infection have been so indefinite that, if attracting attention at all, they have been attributed to a slight chill or other minor ailment and their significance missed. We might be less inclined to believe this were there not cases of intermediate severity, the so-called abortive cases, in which symptoms, while sufficiently definite to attract attention, do not progress to paralysis.

In America, diagnosis of these abortive cases is becoming increasingly frequent on the basis of a suspicious symptomatology confirmed by cerebro-spinal fluid examination. In this country, unfortunately, diagnosis is commonly not made until the child has been paralysed for 24–48 hours. This is partly due, of course, to the greater relative frequency of sporadic cases, but it is also in part attributable to the fact that the general practitioner has not been taught to recognise the initial symptoms as those of poliomyelitis. In the period when the disease was believed to be due to a systemic infection only later localising in the nervous system, the tendency was to dismiss the early symtoms as those common to all febrile disturbances. Now that it appears highly probable that from the first entry of virus by the nose poliomyelitis is a nerve-cell disease, observers are realising that the initial symptoms must be indicative of the march of the virus from nucleus to nucleus on its way to the cord.[6]

In the *first phase* of poliomyelitis it is not so much the individual symptoms that count as the general impression received by an experienced observer. As an American authority says:—

> ". . . there seems to be little doubt in the minds of those who have seen much of the earliest hours of the disease that a very definite and characteristic clinical picture presents itself. But it is difficult by descriptive method to transfer an adequate impression of the subtle and striking difference between the onset hours of infantile paralysis and those of any other of the acute infectious diseases of childhood. To say that the temperature is elevated, often as high as 103° or 104°, and that the child is flushed and miserable; that vomiting often occurs and that drowsiness supervenes, does not offer sufficiently distinguishing evidence of the special type of infection. Nevertheless, this common symptom complex is shot through with delicate manifestations that are unmistakably specific, but which must still be viewed as clinical impressions—those helpful though indefinite aids in diagnosis.
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> "Now when infantile paralysis becomes epidemic in a locality which has been previously free from its presence, the physicians in that territory soon appreciate this difference from the usual illnesses of children—there is a look of mingled apprehension and resentfulness quite unlike the alert, bright, and shining eye of other fevers. The psychic change responsible for this look finds further expression in a characteristically annoyed shrugging of the shoulder which occurs when the child is touched or simply spoken to. Indeed, there is frequently a snarling whine of resentment which is synchronous with this gesture of discontent. . . . (In) cases of overwhelming infection . . . there are other striking phenomena. The child is restless, breathes rapidly, and seems to be busily and actively resisting some incomprehensible disturbance of its usual comfort. In these instances, the irritability and resentful manner are not marked, but the whole organism seems to be composed of tensely drawn wires —a universal overstimulation. This pressor state of the nervous system is so marked that a sort of impulsive ataxic tremor is present in every motion, especially when that motion has intent. . . . Usually a few cases are met with whose profound stupor masks all other signs and symptoms. . . ."

Among the manifestations of specific nature here mentioned we may note especially (1) disturbance of sleep rhythm—sleepiness by day and restlessness by night as occurs in a more pronounced degree in some cases of encephalitis lethargica; (2) general hyperæsthesia to every touch and passive motion whatever their situation; (3) disturbances of the vegetative system—sweating, flushing, disturbed intestinal peristalsis, tachycardia, and so on. It has been suggested[6] that almost all of the symptoms at this stage can be referred to lesions in the thalamus and hypothalamic region, and we know that after intranasal inoculation in the monkey these are among the first centres infected from the olfactory bulbs.

In the *second phase* of the disease, still in the absence of paralysis, the foregoing symptoms continue, but new symptoms and signs are now more prominent. These are localised pains and tenderness (rather than general hyperæsthesia), stiff neck, painfulness of the neck and spine to flexion. Ataxia, tremor, and early weakness follow. According to the older theory of pathogenesis, these are signs of meningeal irritation announcing the extension of the systemic infections to the meninges. To-day, knowing that there is no systemic infection and that meningitis is not a feature at this stage of the disease, but that there are lesions in the spinal ganglia and posterior horns of the spinal cord, we accept these symptoms as evidence of the further march of the virus from higher regions to lower, probably largely through the spino-thalamic tract.[6]

The *third phase* of poliomyelitis, that of flaccid paralysis, represents the final onslaught of the virus on the motor cells of the anterior horn, which for some unknown reason are peculiarly susceptible to its action. To diagnose poliomyelitis at this stage is equivalent to shutting the horse's tail in the closing stable door.

The rate at which the disease progresses from one point to another is subject to considerable variation.[6] In some cases it is more than a week from the appearance of the first symptoms before paralysis occurs. In the abortive cases (diagnosed by positive findings in the cerebro-spinal fluid) paralysis never occurs, though there is little difference between the initial symptoms in this group and in that which later becomes paralysed. In many cases there are intervals of interrupted progress—in fact there is in man a conspicuous tendency for the disease to come to a stop temporarily or permanently anywhere in its course. On the other hand, many cases progress very rapidly. Nevertheless, it is rare to find a case in which characteristic alterations of the spinal fluid cannot be detected before the appearance of paralysis, and early diagnosis can almost always be made, provided that knowledge of the early symptoms suggest to him the simple operation of lumbar puncture.

In the text-books are described various forms of poliomyelitis, the bulbar, the cerebral, the cerebellar, &c. The returns of the Registrar-General each year report a certain number of cases, constituting possibly 20 per cent. of the total, and designated polio-encephalitis. What they all are is very difficult to find out. Some, no doubt, are bulbar cases of poliomyelitis, that is, cases in which the motor nuclei of the brain-stem happen to be more affected than those of the cervical and lumbar cord; to label them polio-encephalitis may be technically correct, but is nevertheless confusing as there is no essential difference between them and the usual forms. Levels of the central nervous system above the brain-stem are probably never involved more severely than is necessary to produce the symptoms of the preparalytic stage, and the so-called cerebral and cerebellar forms of the disease are almost certainly due to some other cause; it has never been shown that the virus of poliomyelitis can evoke such syndromes in either man or monkey.

Landry's Paralysis

Another syndrome to which I must now briefly refer is that passing under the name of Landry's paralysis. By definition this is an acute ascending flaccid paralysis with minimal sensory and sphincter disturbance. Most of the cases prove fatal from involvement of the medullary centres. Cases which recover are said to do so completely. Fatal cases show no definite changes in the nervous system, which fact perhaps links the condition to the more severe types of acute toxic neuritis.

Now an identical symptomatology may obtain in at least two neurotropic virus diseases, though sections show in these cases definite and characteristic lesions in the spinal cord. One such disease is poliomyelitis—the more severe cases with weakness beginning in the legs and rapidly ascending to the medulla fulfil all the clinical requirements of Landry's description. The second condition is rabies. In the usual form of this malady the symptoms until a late stage are those of overstimulation rather than of paralysis of the nerve centres. But sometimes in man, and constantly in certain species of animals, paralysis predominates from the start. In most parts of the world human ascending flaccid paralysis due to rabies is far from frequent; in an outbreak in Trinidad, however, in the years 1929–31, all the cases were of this type, and the nature of the infection was never suspected until animal inoculation revealed, not the virus of poliomyelitis which had been under suspicion, but that of rabies.[7] Even then it was not clear whence originated the infection, for the island has as strict a quarantine as does this country, and rabies in dogs is unknown; finally some evidence was accumulated to incriminate the vampire bat, biting the toes of natives sleeping in the open, as the transmitter of the virus.

It seems, therefore, that we can either accept the original and text-book specification of Landry's paralysis, with the proviso that we cannot possibly be sure of the diagnosis until we have histological preparations of the spinal cord, or we must admit that Landry's paralysis is no more than a clinical syndrome common to a number of very different conditions.

Herpes Zoster

We have seen that poliomyelitis virus has an especial affinity for the lower motor neuron, and we may now devote a moment to herpes zoster which attacks the lower sensory neuron. We believe zoster to be a virus disease both on general and epidemiological grounds, and because inclusion bodies have been found in the vesicular skin lesions. We have, however, no final proof of this, partly because zoster is not a fatal disease but chiefly because we have no experimental animal in which to test our theories. Up to the present, transmission with fluid from the vesicles has succeeded only in children who have not suffered previously from zoster or varicella; such children develop either a localised vesicular lesion or occasionally a generalised eruption indistinguishable from that of varicella. In zoster the most marked changes are usually in the spinal ganglia corresponding to the level and side of the eruption, or on occasion in the Gasserian or geniculate ganglia in the case of the rarer distribution of the eruption, but the corresponding nerves and nerve-roots are involved, as are also the posterior horns of the spinal cord. Very rarely the anterior horns are affected and paralysis ensues. There are two groups of cases, that in which no known predisposing cause operates, and that in which the eruption is precipitated by some other pathological condition of the ganglion—syphilitic inflammation, carcinomatous infiltration, trauma, arsenical medication, and so on. Since specific complement-fixation tests are obtained in both groups, if the former is ultimately proved to be due to a virus, we shall have to conclude that the latter is caused by the same virus latent in the patient until activated by the predisposing morbid condition.

Most interesting, however, is the apparent relation of zoster to chicken-pox. Quite often the latter has been reported as occurring, within the usual period of incubation, in a recent contact with a case of zoster, and much less often the reverse has been noted. Zoster and a generalised eruption like that of varicella may occur together in the same patient. With the complement-fixation test cross-immunity between the two infections can be demonstrated.[8] Finally it has proved possible to isolate from the vesicular fluid in zoster and varicella elementary bodies similar to those in vaccinia and small-pox. Pure suspensions of the bodies of either origin are specifically agglutinated by both zoster and varicella convalescent sera.[9] It is clear that the relation between the two infections, suspected now for many years, is a close one.

Encephalitis Lethargica

The next disease demanding consideration is encephalitis lethargica. It first appeared in Europe about 1917, and soon spread to almost all countries. In Japan it occurred together with an entirely different virus encephalitis, which had been recognised previously and has outlasted encephalitis lethargica; the two are there known as the Type A and Type B encephalitis respectively. Many workers were attracted to this new field of investigation, and then the acute disease virtually disappeared.

Again, on general grounds we believe this to be a neurotropic virus infection, but again final proof is not forthcoming. Various claims have been made that the virus has been discovered, but in most instances the organisms isolated appear to have been strains of the virus of herpes febrilis. Since this virus has been obtained from the cerebro-spinal fluid of a case of neurosyphilis, and other evidence speaks against its ætiological rôle in this connexion, only a mere handful of observers believe that it is the cause of encephalitis lethargica. Inclusions of the type usually associated with virus infections have been described but rarely, and on these occasions the diagnosis has not been beyond doubt. Our present interest in the condition is thus largely clinical.

Encephalitis lethargica began as a hyperacute malady characterised by headache, vertigo, delirium, and convulsions. The average onset then became more gradual, and lethargy occupied a prominent place in the symptomatology. Coma occurred in the terminal stages. Often restlessness at night alternated with sleepiness by day—a symptom which we have already seen obtaining in slighter degree in the preparalytic stages of poliomyelitis. Occasionally the reverse disturbance of sleep, insomnia, prevailed. Ophthalmoplegias due to damage to the ocular nuclei of the mid-brain were an almost constant feature. Choreiform movements, myoclonic muscular contractions, a parkinsonian facies, and catatonia also occurred in some of the earlier acute cases. Roughly one-third died, one-third recovered, and one-third passed into the chronic stage; in the last group both mild and severe initial cases were represented.

In the chronic disease many of the major features of the acute attack are represented in a modified form.

Extrapyramidal disturbances of motility find their expression in the condition of parkinsonism, probably resulting from injury to the substantia nigra.

Mental symptoms indicating involvement of the highest levels of the central nervous system were in mild cases confined to protracted nervousness, undue lassitude, anxiety, depression, and inability to concentrate. Often, however, especially in children, they were more severe, and constituting a complete reversal of the patient's previous mentality and morality led him into abnormal behaviour which in many cases necessitated institutional treatment.

In the earlier days of the epidemic disorders of sleep often persisted after the acute stages. Lethargy, insomnia, and reversal of sleep rhythm need no further mention. Narcolepsy was an occasional sequel; it also occurs, of course, as an independent disease. In this condition the patient feels an uncontrollable desire for sleep which must be gratified however inconvenient the time or place, and he lapses into slumber during the course of conversation, and passes his destination in tram or bus. The attacks may recur several times daily or only at infrequent intervals, and last usually only a short time; they often come on in circumstances normally conducive to sleep, as after lunch on a warm day.

Possibly allied to these disorders of sleep are peculiar periodic attacks usually involving the musculature of the eyes and jaws, upper trunk and limbs, or the respiratory mechanism. Among the most interesting are the oculogyric crises. The patient may state that with or without warning the eyes "shoot up into the head." As a rule the movement is upwards, but it may be in other directions. The eyes become fixed and cannot be brought back. This may take place twice or thrice a day or only once in several weeks, and may last a few minutes or several hours, during which time the patient is helpless. Not infrequently an attack ends in sleep, and sleep always ends an attack. It may be started by emotional excitement, but sometimes also be inhibited by will or by some external, mental or physical stimulus. Retraction or deviation of the head, restlessness, dizziness, flushing of the face, diplopia, opening of the mouth, all may accompany the attack; sometimes the crises are accompanied by curious psychological phenomena in the nature of compulsive ideas. There is evidence that in this condition the eye muscles are not in spasm as one might think, but at rest; in other words the eyes are in the position to which normally they wander during sleep—a position which varies in different individuals and perhaps in the same individual at different times. In short it seems that the ocular muscles have gone to sleep while the remaining phenomena of sleep are absent. Similarly attacks of lid-closing may represent a dissociation of the phenomena of normal sleep.

Disorders of respiratory rate, usually in the direction of an increase, may be paroxysmal or continuous. Alterations of respiratory rhythm, or breath-holding spells accompanied by choreo-athetoid movements of the limbs and bizarre attitudes, or respiratory tics including yawning, sniffing, spasmodic cough and spitting are also encountered.

Some Other Neurotropic Virus Infections

Of the other neurotropic virus infections, the Australian X disease, though largely a disease of childhood and adolescence, differs from poliomyelitis in that the symptoms are mainly cerebral in nature; paralyses are rare and not persistent. From encephalitis lethargica the diagnosis is made by the infrequency of cranial nerve palsies and the usual complete recovery. The virus, moreover, is definitely pathogenic for monkeys, sheep, and other animals. The fact that some sheep are refractory to infection suggests possibly that this is a disease also, or even primarily, of domestic animals.

The B virus has been responsible for two cases of ascending myelitis, one in a research worker who was bitten by an apparently healthy monkey, the other in a laboratory attendant accustomed to handle these animals. For this reason, and because normal monkeys may show a high titre of neutralising antibodies to this virus in their serum,[1] it appears that the disease is one frequently occurring in the monkey: experimental work shows that the monkey infected in the skin with the virus does not acquire a fatal myelitis but may survive immune. On the other hand, in the rabbit a disease develops exactly similar to that in man, and invariably proceeds to a fatal termination.

Another animal disease potentially capable of affecting man is louping-ill. This malady of sheep is endemic in some areas of Scotland; since the virus was first isolated in 1928 no fewer than four laboratory workers have developed symptoms varying from a mild attack of what was called influenza to a definite encephalitis with headache, vomiting, delirium, tremor, and lethargy, with subsequently neutralising antibodies to the virus in the blood.[10] The possibility of the disease occurring in farm hands in the infected areas should be considered.

The St. Louis outbreak of encephalitis[2] occurred in that town and Kansas City during July to October, 1933, and affected more than a thousand people. In many respects its chief features were those of the Japanese type B encephalitis. For example, it occurred in elderly rather than young subjects, and although the total mortality was in the neighbourhood of 20 per cent., only 5 per cent. of patients under the age of forty succumbed. However, the identity of the two has since been denied. Although certain workers hailed the outbreak as one of encephalitis lethargica, it differed in that a virus pathogenic for mice and monkeys was isolated without difficulty. Mental confusion, aphasia, tremor of the hands, tongue, and lips, and drowsiness seem to have been the commonest symptoms, though vertigo, ataxia of the arms and legs, facial paralysis, and spastic weakness of the limbs are also recorded. Ocular symptoms were rare. Recovery was rapid and complete.

It is perhaps difficult for us to interest ourselves greatly in outbreaks of encephalitis in Japan, Australia, and the Middle West of America; these countries are so remote and there are so many pressing problems nearer to hand. But I feel that we should at least bear them in mind. Not only may their study throw light on what has hitherto been obscure in more familiar infections, but to-morrow may see them epidemic in our own population. Year by year transport becomes more and more rapid, and more and more people travel widely. When the present economic depression is over this tendency will be even more apparent than to-day. Another war may bring into direct contact peoples from opposite ends of the earth. It is within the bounds of possibility that there may result world-wide epidemics of diseases previously confined to one locality, and among these we must not ignore the various types of encephalomyeltis.

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THE FORCEPS OPERATION

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IN an attempt to lessen mortality, damage, and illness resulting from the abuse of the forceps operation obstetric leaders have for many years advocated the decreased use of the instrument. The fact that this advice has required such repetition shows that for the most part the seed has fallen upon stony ground. In those hospitals which are in charge of the expert obstetricians, some control can be and is directed to the incidence of the forceps deliveries. Such institutions indeed take pride in an ever-decreasing forceps rate. But obstetric practice outside hospitals presents altogether another problem. A forceps delivery may be forced upon the doctor in charge by pressure from the patient or her relatives; he may have been engaged to conduct labour with the express purpose of ensuring its expedition; he may himself be pressed for time and quite unable to spend several hours watching the fœtus appear and disappear; or his efforts may be directed solely towards relieving the patient of what he considers to be unnecessary suffering. In addition to these possible factors, the control of a patient in her own home is a very different matter from her control as an inmate of a large hospital. For all these reasons I contend that advice directed against the use of the forceps is unlikely to be acceptable because it is not really practical.

The following figures were obtained from one of the leading maternity homes in London and the patients, for the most part, were under the care of obstetric specialists who are teachers of this subject. Delivery was completed by the forceps operation in 203 of the last consecutive 300 cases (primiparæ). The maternal morbidity was low, under 2 per cent., the maternal mortality nil, and the infant mortality under 3 per cent. In the great majority of cases the fœtal head was resting on the pelvic floor. It is thus likely to be more profitable to find some way of reducing the risks associated with the application of forceps than to attempt to stop their use. I hope to show that the substitution of a short light forceps for the axis-traction design will meet the needs of the doctor and will enable him to shorten labour without danger to mother or child. In order to appreciate the reasons why the axis-traction forceps should be superseded by a more suitable instrument for the delivery of a head low in the pelvis it is necessary to recall briefly the history and evolution of the obstetric forceps.

About the beginning of the seventeenth century the prototype of the obstetric forceps was devised by the Chamberlen family. It is sufficient to note that for the first 150 years of its existence the instrument was of the short straight variety. The lock was then added, as also was a short shank, whereby the radius of the cephalic curve was lessened and the blade more closely fitted the fœtal skull. In the middle of the eighteenth century Levret and Smellie independently altered the existing type by lengthening of the shank and adding the pelvic curve. After another century Tarnier introduced the principle of axis traction.

During the last eighty years there has been no change and the modern instrument used in practice and in the teaching schools is the long curved forceps with some axis-traction modification.

This evolution of the obstetric forceps was consequent upon the use to which the instrument was put. Primarily the forceps was used to aid delivery of the fœtal head; for obvious reasons the instrument could only be applied to a head low in the pelvis. In the attempt to adapt the instrument to assist the delivery of a fœtal head obstructed in the mid-pelvis the forceps was lengthened. The tractive power was greatly increased by the addition of the English lock by Smellie. The blades were applied more correctly to the fœtal skull and the attitude of flexion was less disturbed by the addition of the pelvic curve. The final refinement was the application of the various axis-traction modifications. These are ingenious and for the main part mechanically sound. With their aid an immensely greater tractive effort may be exerted.

Disadvantages of the Axis-traction Forceps

There is to-day little need for the continued use of this bulky, powerful, and ingenious instrument. The conditions that may necessitate a forcible extraction of the fœtus are cases of disproportion between the pelvis and the fœtal head as a result of contraction of the former or malposition of the latter. Occasionally the delivery of the fœtal head from the mid-pelvis may be considered advisable owing to the appearance of signs thought to be indicative of fœtal distress. It is my considered opinion that in such cases a forcible and rapid delivery often prejudices the survival of the baby.

Before the late war preventive medicine began to establish a hold on obstetrics, and from 1919 onwards what we know as antenatal supervision has developed rapidly. One of the aims of antenatal work is to discover those cases in which obstruction may occur in labour because of a misfit between the head of the child and the pelvis of the mother. It is not necessary here to discuss the many methods used to deal with the problem of dys-tocia, or to criticise the success or failure thereof. One result, however, is apparent. Whenever any serious attempt at antenatal supervision has been made the major degrees of disproportion have been foreseen. The detection of the abnormally small pelvis or large baby is not now left until a condition of obstruction has developed after some hours in the second stage of labour, but the presence of disproportion is discovered during the preg-nancy. The fœtal head that is not engaged in the pelvis in the latter weeks of pregnancy is regarded with grave suspicion and every effort is made to detect a possible misfit. In consequence, even in the obstetric hospitals to which such emergencies are sent, it is unusual to see ses in which completion of the labour necessitates struction of the child or the high forceps operation. ould a case of this nature occur it almost invariably found that the patient has had no antenatal examination.

It has been pointed out above that the long curved rceps as used to-day was conceived, designed, and nstructed to deal with the case of the woman whose regnancy had had no supervision and in whom bstructed labour had occurred, the fœtal head having iled to descend in the pelvis. There is abundant roof, clinical and statistical, that to-day the high rceps operation for minor disproportion is seen ut rarely, and, in theory, it should never be required hen the patient has had adequate antenatal care. elay in labour may occur with the head in the midelvis or at the pelvic brim as a result of incomplete tation or flexion or because of the posterior position f the occiput. Miller and Stacey, in an analysis f the causes of the "failed forceps" operation, nowed that the occipito-posterior position is a most nportant cause for the failure to complete delivery.

When delay in labour occurs and the fœtal head is nywhere but on the pelvic floor there is no call for he use of an instrument lengthy enough to reach and rasp it. Such delay indicates, rather, the anæsthetisation of the patient and a thorough examination o ascertain the cause. Too often this is not done. he forceps are applied, a silent appeal is sent out o the goddess of luck, and a good deal of force xerted. This usually results in the "failed forceps" ase to which reference is made below.

Certainly in theory, and almost as certainly in ractice, there is to-day far less indication for the igh forceps operation and therefore for the use f the long curved instrument.

That the use of the long curved forceps is fraught vith potential dangers to mother and child is well nown, so much so that most writers of text-books onsider it necessary to devote a special section to the langers of the forceps delivery. The student is varned that the lower segment and the cervix may be torn if the head of the child is forcibly pulled through an insufficiently dilated cervix, that the vagina and vulva may be injured, and that the bladder even may be torn. Post-partum hæmorrhage may follow too rapid delivery, and uterine sepsis is more likely to supervene in such cases. The skull of the child may be fractured or its scalp torn, the face of the child may be paralysed or its eye may be injured; meningeal or cerebral hæmorrhage in the child may occur.

This frightful list is no exaggeration. It has, in fact, been reproduced from a well-known standard text-book, and most of the calamities prophesied may in fact be encountered by one with only a small experience of obstetrics. But the whole story of the dangers attendant on the use of the forceps has by no means been told, notably the great danger to the mother of the so-called failed forceps case. Such cases occur so frequently and are accompanied by so extensive a maternal mortality and morbidity as to cause grave concern, and the subject comes up for discussion regularly at meetings of the obstetric societies throughout the country.

It has been shown repeatedly that failure to complete the delivery with the forceps often is not due to a mechanical obstruction. In only a minority of cases is [illegible] "delay" in labour due to the fact that the baby's head is too big for the pelvis; thus, lack of adequate antenatal supervision is not responsible in any way for the failure.

Stacey,[1] in a review of 154 of such cases, found that in no fewer than 100, or 66 per cent., the forceps were applied when the cervix was not adequately dilated to deliver the child. In 47 of these cases there was no possible cause, other than the incompletely dilated cervix, to account for the failure to deliver. In 3 per cent. only of the series was failure to complete the delivery due to disproportion. Miller,[2] in a study of 558 cases, has demonstrated precisely the same causes for the failure. In this series the application of the instrument while the woman was in the first stage of labour, or prematurely to a head in the occipito-posterior position, accounted for 3 out of every 4 cases where failure to deliver had occurred. There was a maternal mortality of 10 per cent. in Miller's series of cases. Stacey gives a most comprehensive review of the end-results of this disastrous complication. The maternal mortality was 14 per cent. and the maternal morbidity (B.M.A. standard) 25 per cent. Only 48 per cent. of the infants survived. A follow up of the patients who recovered showed that over half the women suffered from damage to the perineum, vagina, or cervix, which in a few amounted to the grossest examples of trauma involving the lower uterine segment, bladder, or rectum, and resulting in vesico-vaginal and recto-vaginal fistulæ.

I have directed attention to failure to deliver after the application of the forceps because its consequences are so serious. The authors of text-books have, almost without exception, omitted to insert sufficiently grave warnings on this subject, other than that the instrument should not be applied unless the cervix is fully dilated and taken up. The increased risk to the child in the high or medium forceps operation requires no emphasis. In many of these cases the instrument is applied to a fœtal head not fully flexed or to one lying transversely, obliquely, or with the occiput posterior in the pelvis. Crawford's[3] remark that the same doctor who handles a new-born infant with the gentlest care thinks nothing of applying powerful compression to the fœtal head is worthy of serious consideration.

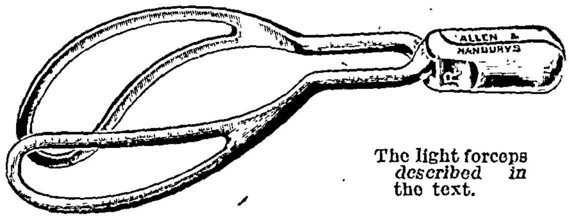
No further emphasis need be laid on the danger both to mother and child that may attend the use of the long curved forceps with axis-traction modification. To-day there should but rarely be the necessity to resort to any but the low forceps operation, which consists in the lifting of the fœtal head past the perineum. The question may next be asked why it is that throughout the country the medical student continues to be taught the use of a heavy and powerful instrument so constructed that (1) it can be applied to an undescended fœtal head, (2) it can be used when the os is not fully dilated, when its misuse is attended by the risk of grave danger to both mother and child, and when the circumstances for which it was designed no longer exist in theory and are but rarely seen in practice? The misuse of this instrument is variously described as being the result of ignorance or apathy on the part of the practitioners, or the deficient teaching of practical obstetrics to the medical student. Thus the Scottish Departmental Committee in their interim report state[4] that: "in nearly one-third of the cases classed as errors of judgment on the part of the doctor, the mistake was premature application of the forceps."

REASONS FOR ITS CONTINUED POPULARITY

The explanation for the continued popularity of the long curved forceps is probably to be found in the combination of a number of circumstances. First, the instrument has the weight of tradition behind it, and though it has its dangers, is used and has been used times without number to put an end to pain and suffering. Secondly, it is only in a small percentage of cases that its use is accompanied by damage to the mother and child. Thirdly, in the teaching schools its use is to some extent regulated and restricted. Teachers have largely themselves to blame for the students' lack of appreciation of the potential dangers of the mid- or high-forceps operation. This operation is almost universally relegated to the house-officer, or at the best the obstetric registrar may be asked to give his aid. It is unconvincing, to say the least of it, to thunder or bewail at the probable dangers attendant upon a certain procedure when its execution consistently is left in the hands of a junior. The solution of the difficulty does not lie in the making of rules which shall regulate the circumstances under which the forceps may be used. Such rules have been formulated, repeated and emphasised. They are for the most part unavailing and Miller [2] sums up the situation very well in saying that "to insist that the forceps should not be applied unless on strict obstetrical indications may be a council of perfection." The solution is that the medical student should never see the long curved instrument used for routine forceps delivery. The appearance of this instrument should be respected and whenever possible accompanied by a visit of the obstetric physician to the labour ward.

A Short Light Forceps for Delivery of the Low Fœtal Head

What is needed nowadays is an instrument that can complete the delivery of a fœtal head that is low in the pelvis. This instrument should be designed for the purpose and its design should be such that it cannot be applied to the head that is high in the pelvis or through an undilated os, and that its application cannot be followed by the employment of tremendous tractive efforts. Two hundred years ago William Smellie [5] wrote "to free myself from the temptation of using too great force, I have always used and recommended the forceps so short in the handles that they cannot be used with such violence as will endanger the woman's life." Miles Phillips [6] comments on this teaching and writes: "I tell my students that the long curved forceps might well be kept at the Town Hall, and be only available on a magistrate's order." This is an excellent suggestion in more ways than one for by the time the innumerable application forms had been duly filled in, signed and countersigned, and the instrument procured, the baby would mostly have been born.



The light forceps described in the text.

In William Smellie's day there was no antenatal supervision and in consequence it must be supposed there was a correspondingly greater number of cases in which the use of the long curved forceps was indicated. Yet even he advocates an instrument with short handles which cannot be used with great force. The universal adoption, especially in the teaching schools, of a short light forceps is greatly to be desired. Some few years ago I discarded the long curved instrument and began to use Simpson's short straight forceps. The instrument had the disadvantage that an incorrect application to the fœtal head was probable. The tips of the blades were apt to grip, bruise, and mark the skin of the baby's head over the supra-orbital ridges. The usual pelvic curve was therefore added to the blades. The instrument I now use (see Figure) weighs less than 10 oz., that is to say, it is about one-quarter the weight of its heavier predecessor. The lightness of the instrument gives the accoucheur an added sense of confidence in that he can appreciate exactly the passage of each blade during its application.

A SERIES OF DELIVERIES BY LIGHT FORCEPS

An analysis of the last 58 consecutive deliveries of primiparous women in my practice shows the following figures.

In all these 58 cases the fœtus presented by the vertex and when the forceps were applied the light instrument only was used. In 23 women delivery was unaided. In 32 women the head was lifted through the pelvic floor with the forceps. In 3 cases manual rotation of a fœtal head in the persistent *occipito-posterior position* was required. The fœtus was delivered easily with the light forceps in 2 of these women. The fœtal head did not sink down into the pelvic cavity after rotation in the remaining case and the long forceps were applied.

From this series it may be argued that it was unnecessary to lift the fœtal head through the pelvic floor in the 32 cases in which this was done, and that these women, if they had been left alone, would have delivered themselves successfully. Probably this would have occurred eventually. But the duty of the attendant is to alleviate pain in so far as it is possible to do so without prejudicing the life or well-being of the mother or child. That has been a legitimate excuse for numberless forceps deliveries in the past. I hold the view that, with efficient ante-natal supervision, by far the most important cause of delay in labour occurs when the fœtal head reaches the pelvic floor and that the very low forceps operation required to effect delivery at this stage is unaccompanied by harm to the mother or child. In the series of cases cited above all the babies were delivered alive and well, with one exception in which there was no bone formation in the vault of the fœtal skull. There was no maternal morbidity. It is interesting to note that the incidence of laceration of the perineum was slightly less in those women whose delivery had been assisted by the forceps.

ITS ADVANTAGES

Anyone who has used the light instrument would expect this. The blades are so slight and apply themselves so accurately to the fœtal head that for practical purposes they do not prov[illegible] any added bulk to distend the vaginal outlet. [illegible] his respect Munro Kerr [7] writes: "as a matte[illegible] fact there is less bruising and injury with judici[illegible]mployment of forceps than if the head is permitted [illegible]ss unduly long upon the perineum." The accurate apposition of the instrument to the fœtal skull a[illegible]ows both forward and backward movement to be controlled by the handle. Thus one of the attendant's hands controls, and controls efficiently, the fœtal head and the other can be used to try to preserve the perineum. To control the spontaneous delivery of a fœtal head three hands really are required; one to prevent too rapid progress, one to prevent the head receding during the interval between contractions [illegible]nd a third to control the perineum. The light forc[illegible] combines the action of the hands which preve[illegible] too rapid progress and the receding of the head. [illegible]hat laceration of the perineum occurred less fre[illegible]ntly in the forceps cases in this series speaks for i[illegible] For in a certain number of these women the [illegible] delay was thought to be due, not to uterine in[illegible] but to the smallness of the vaginal outlet. [illegible]ould not apply to such an extent in women who were delivered spontaneously. The instrument has other added advantages. Its construction is such that it is impossible to exert a tremendous pull, and the risk to the child should in consequence be enormously decreased. The instrument cannot be applied to a fœtal head that is not well down in the pelvis and therefore only rarely before completion of the first stage of labour. It can be applied and has been applied without an anæsthetic when the woman required help in the last stages and the appreciation of the pains was sufficiently dulled by the previous administration of analgesic drugs. In any case, only the lightest anæsthetic is required for its application. The small size of the instrument moreover greatly facilitates the ease with which it is sterilised.

Conclusion

Taking into consideration the facts outlined above and with the firm belief that the really low forceps operation is virtually without risk to the mother or child, I hold that it would be better to advocate a more liberal use of the short light forceps at the end of labour than, turning a blind eye to what is obviously a universal practice, to teach the strictly limited use of another instrument which is far too clumsy and heavy for this purpose.

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THE VALUE OF BREATHING EXERCISES IN ASTHMA

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THE remedial value of breathing exercises in asthma has been known for many years and has been practised by the medical profession in this country and abroad. On the continent Dr. L. Hofbauer, of Vienna, claims excellent results from humming exercises in his book on the treatment of asthma.[1] In this country breathing exercises have been used as an adjuvant to other forms of treatment in various physiotherapeutic departments, including those of Guy's,
the Hospital for Sick Children, Great r having so
and King's College Hospital. , No. 27, also,
than before, is

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Fräulein von Ruchtes
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College Hospital, and Miss Seyfang agreed to treat asthmatics in the clinic by this means. Her results suggested that research, in properly controlled cases, might show the type of patient likely to benefit from this form of therapy. After arrangements for carrying out this research had been made, Miss Seyfang unfortunately found herself unable to continue her work at King's College Hospital and resigned in December, 1932.

As the universally recognised aim of respiratory exercises in asthma is the education of the patient in the proper control of the diaphragm, together with mobilisation of the chest wall, a series of exercises was drawn up by Dr. E. B. Clayton and his assistants in the physiotherapeutic department with these objects in view. They are well-recognised, simple exercises and have been practised by the patients forming the subject of this investigation. Those used by Miss Seyfang differed only in detail.

The cases under consideration have been closely observed for a period of from one to two years and the clinical condition of each has been assessed twelve months after the beginning of treatment, thus allowing for seasonal variations in the severity and frequency of attacks. We are aware that one year is too short a time in which to judge the permanence of results, but we hope to follow up these and other cases and make a further report at a later date.

The aim of this investigation was to observe the results of treatment by breathing exercises alone. For proper scientific control frequent observation of the cases over a period of at least two years would have been necessary and every other form of treatment, including drugs, should have been prohibited; in the asthmatic even a placebo of brown sugar in water might have a psychological effect. In practice we found it impossible to enforce such rigid control, as the mentality of the hospital type of patient requires something concrete—the bottle of medicine or pill—as an incentive to regular attendance. Again all the patients without exception had been taking various remedies obtained from their family doctor or from the chemist, the type and dose of which we could not control. We decided that the only practical course was to prescribe certain simple drugs ourselves and to forbid all other treatment. The drugs were gradually withdrawn as the patients gained confidence in the exercises, commonly in 4–8 weeks.

THE AIMS OF BREATHING EXERCISES

During an attack, in which the bronchioles are narrowed by spasm and congestion, there is a valvular action whereby air drawn in by the strong inspiration can enter the alveoli but cannot escape. Accordingly the asthmatic has difficulty in expiration. The chest is over-distended, air is pent up in the lungs, and there is insufficient gaseous exchange, i.e., a condition of gross *functional* emphysema. When the attack passes off, conditions return to normal. During an attack the breathing is of the thoracic type and the accessory muscles are fully contracted. The diaphragm is depressed to its maximum extent and is seen to be making spasmodic contractions or none at all. The more dyspnœic the patient becomes the more he endeavours to *inspire* and so over-distends his already fully inflated lungs. In chronic cases the
ai typical permanent asthmatic def ci mity of the chest
bro sults—kyphosis, pigeon chest, en Harrison's sulcus.
1/1 is is due to actual shorten the fibres of the
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is grossly diminished. For these reasons the aims of breathing exercises should be :—

1. To empty the lungs by increasing the expiratory phase.
2. To re-educate the automatic diaphragmatic movements and to diminish the thoracic type of breathing.
3. To relax spasmodically contracted muscles.
4. To mobilise the ribs and chest wall and to correct kyphosis.

Various types of simple exercises can be devised to fulfil these requirements and examples of such exercises are given in a booklet recently published by the Asthma Research Council (1934).[5]

We find it best to teach patients to take a *short* inspiration through the nose and then to make a *long* expiration through the mouth, with a whistling or hissing noise; this concentrates the attention on the expiratory phase. During expiration the epigastrium must sink in, to ensure that the diaphragm rises in the chest. (Female patients are forbidden to wear tight corsets.)

A good deal depends on the personality of the teacher: she must gain the patient's coöperation in practising the exercises two or three times daily for at least ten minutes, over a prolonged period; she must also try to enthuse him with the benefit he is likely to obtain from the treatment. She must warn him that at first the exercises may make him worse by causing coughing and wheezing, which are produced in the majority of cases on full expiration. This loosens the mucus, which is presently coughed up, to the patient's relief. She must also persevere until the patient acquires habitual diaphragmatic breathing.

The patient is encouraged to practise the exercises, gently, when he feels an attack is imminent, in order to abort it.

ROUTINE OF INVESTIGATION AND TREATMENT

In each case a complete history was taken and a clinical examination made, including measurements of the chest expansion and screening of the diaphragmatic movements. In all cases suspected of nasal disease a laryngologist's report was obtained. The home conditions were investigated in considerable detail by the almoner's department; every patient kept a record of his attacks or wheezing in a notebook, which was inspected at each visit to the clinic.

Of the routine investigations, only those relevant to the subject will be discussed in this paper; the results of the remaining investigations will be dealt with in separate articles.

As far as possible all cases were treated in the same way. Attendance for instruction in breathing exercises was required twice weekly at first and at longer intervals as the patients progressed. During the first few weeks of treatment a mixture containing Potassium Iodide gr. v., Tinct. Camph. Co. ℳ xlv., and Tinct. Stramonium ℳ x., was given in some cases, and ephedrine or ephazone tablets for the attacks; these drugs were withdrawn as the cases improved. The patients were instructed not to take late meals. Other therapeutic measures, such as vaccines, nasal operations, and removal of sensitising proteins (feathers, dust, foods), were rigidly avoided, even though they were obvious causative factors, in order that the full value of breathing exercises might be gauged.

CLINICAL RESULTS

It is difficult in an alternating and paroxysma condition such ;orc·sthma to assess the results ,e treatment in a at an·ic manner; as has been sne before, we do n·robable·der that a year's observa·ere is sufficient to ·ise, and he use of the term "cur·y's in any case. A·pra-orbit., we have used the foll·elvic terms as conveying best, in our opinion, the varying gradations of the patient's condition :—

Excellent (E.).—Cases free from all wheezing or attacks of asthma but still doing breathing exercises.

Very good (V.G.).—Cases having an occasional wheeze but no real attacks; still doing breathing exercises.

Much improved (M.I.).—Cases which are very much better, although still having occasional attacks and wheezing.

Improved (Imp.).—Cases showing only slight improvement.

Failure (F.).—Cases showing no improvement, although the exercises have been conscientiously practised.

This report is based on the study of 75 cases, of which 38 were male and 37 female. The ages varied from 3 to 75 years, 21 cases being under 15 years of age. Other manifestations of allergy (hay-fever, eczema, and so forth) were found in 32 cases. A family history of allergy was found in 51 cases.

The cases were divided into two groups, "allergic" and "bronchitic."

By *allergic* is meant cases which are hypersensitive to certain substances, as judged from their history or response to skin tests. As a rule the onset of symptoms is in early life, and there is a positive family history of other allergic conditions—namely, hay-fever, eczema, migraine, and urticaria; 49 cases came into this group.

By *bronchitic* is meant cases in which the asthma seems to follow or be related to bacterial infection of the respiratory tract; 26 cases came into this group.

Table I. shows the clinical results, at the end of one year, of a group of 75 cases treated by breathing exercises alone and compared with a control group of 50 similar cases, in which the treatment has been specially selected, e.g., removal of various antigens (feathers, dust, foods, &c.) to which the patients were sensitive, vaccines for the bronchitic type, nasal operations, hydrochloric acid for the achlorhydric, and various specific and non-specific desensitisation for others.

TABLE I.—*Results of Treatment*

Results of 75 cases treated by breathing exercises alone.					Control group of 50 cases treated by special methods.	
Result at 1 year.	Allergic.	Bronchitic.	Total Nos.	Distinct clin. imp.	—	Distinct clin. imp.
Excellent ..	10	3	13	52 out of 75 cases.	11	36 out of 50 cases.
Very good ..	17	8	25		14	
Much improved..	10	4	14		8	
Improved ..	4	8	12	—	3	—
Failures ..	8	3	11	—	11	—
Total ..	*49*	*26*	*75*		50	

Clin. imp. = clinical improvement.

To control the ·al improvement can be claimed in three hands really ·s treated by breathing exercises rapid progress, onc··ced in the first three groups; during the interval betw··he 47 allergic cases and 15 to control the perineum. I. It will be observed that the action of the hands w··ts is very similar to that progress and the receding of t··d by special methods, tion of the perineum occurred ·clinical improvement. forceps cases in this series speaks ··ce in favour of the certain number of these women the ·nt. thought to be due, not to uterine in··. effort by the smallness of the vaginal outlet. ·Th··in lazy or

TABLE II

No.	Sex.	Age.	Duration of disease in years.	Type.	Season.	Diaphragm movements.		Average number of attacks per three months.		Aver. number of attacks and wheezes during first three months of treatment compared with number in same three months one year later.		Clinical results of cases.
						Before B.E.	After B.E.	Before treatment.	During year of treatment.	Attacks.	Wheezes.	
49	M.	30	1	A.	Any.	V.G.	V.G.	90	0	0 : 0	1 : 0	E.
32	M.	60	7	A.	,,	M.	V.G.	90	2·25	18 : 9	30 : 1	V.G.
113	M.	9	0·5	A.	,,	V.G.+	V.G.+	90	10	21 : 4	21 : 4	M.I.
94	F.	36	11	B.	,,	V.G.	V.G.	30	3·8	8 : 2	58 : 90	,,
115	M.	·75	34	B.	W.	G.	G.	3	5	14 : 1	85 : 82	Imp.
27	M.	36	3	A.	S.	—	—	90	7	22 : 2	52 : 105	,,

B.E. = Breathing exercises. A. = Allergic. B. = Bronchitic. S. = Summer. W. = Winter.

unconscientious cases; this type of patient will probably prefer desensitisation treatment, which depends on the physician's efforts rather than on his own. We are trying to show that there is a simple form of therapy which gives good results in those patients who are anxious to help themselves.

The relation between the clinical results and the duration of the disease shows, as would be expected, that the longer the duration of the condition the greater the number of failures:—

Duration in years.	Cases.	Failures.
Over 20	9	4
From 10 to 20	16	2
,, 5 ,, 10	11	1
,, 1 ,, 5	32	4
Under 1	7	0

In this series the females seemed to do better than the males, 27 out of 37 cases being very much improved as opposed to 25 out of 38 males. This holds true for all ages. The number of cases is of course too small for any generalisation.

The nomenclature used in Table I. does not quite show the difference between patients who before treatment had had daily attacks which were reduced later to one or two per week, and patients who before treatment had only a few attacks per annum which were reduced later to about half the number. Both are classed as "improved." In order to bring out this difference we have prepared a table based on the number of attacks before and after treatment, as defined by each patient in their asthma record books. This method of assessment corresponded very closely with the nomenclature used in Table I. A few examples are given in Table II. to show the details recorded. The table shows the basis of our clinical classification, and gives a good idea of the progress of the case. For example, Case No. 94, a housemaid, although still having slight daily wheezes, is no longer having so many or such severe attacks. Case No. 27, also, although having more wheezing than before, is getting fewer and far less severe paroxysms; he expresses himself as being "very much better." We have grouped him under the heading "improved" rather than "much improved" because he is ha[illegible] more frequent wheezes than before.

DIAPHRAGMATIC MOVEMENTS

Observation of the diaphragmatic [illegible]ments by screening before treatment sho[illegible]d excursion in 38 of the 75 cases. Sixt[illegible] the cases were re-screened after treatment. In many of these we observed a very big excursion of the diaphragm. As would be expected, before treatment was begun good diaphragmatic movements were found in a larger proportion of the males than of the females. However, after treatment, when the females had learned to use the diaphragm, this difference was no longer apparent.

CHEST MEASUREMENTS

The chest expansion at the level of the fourth rib and of the epigastrium was measured before treatment and afterwards at three-monthly intervals. Before treatment, in most cases, the chest expansion was poor, especially at the epigastrium, whereas afterwards it improved. Those patients who had naturally a good epigastric expansion, or acquired this with treatment, improved clinically and vice versa. The actual measurements varied with the type, age, and sex of the individual, but on the whole an expansion of at least 2½ in. at the fourth rib and 2 in. at the epigastrium was obtained by those who improved markedly as regards their asthmatic condition. Details of these observations will be given in a subsequent paper on respiratory efficiency in asthma.

OBSERVATIONS BY THE PATIENTS

About half of the patients who have done well clinically state that they can abort all but very severe attacks by doing breathing exercises. Many of the bronchitic cases also find that, although they still have attacks of bronchitis, these are no longer accompanied by attacks of asthma. A few patients say that they have far less bronchitis than formerly.

DISCUSSION

The results show that half of the cases, 38 out of 75, are, for all practical purposes, symptom-free. In a further 14 the clinical condition is markedly improved. Considerably better results have been obtained in the allergic than in the bronchitic group. This difference is mainly accounted for by repeated attacks of bronchitis in the winter months; better results in the bronchitic group are, in our view, likely to be obtained by combining vaccine therapy with breathing exercises. (Incidentally asthmatic patients are very much more sensitive to vaccines than ordinary bronchitics, and should be given not more than 1/100 of the average dose.)

The better results obtained in the female cases depend on the fact that most of these were poor diaphragmatic breathers; there was consequently more scope for improvement among them and a larger proportion acquired control of the diaphragm after breathing exercises. An important factor in this connexion is that the females had discarded tight corsets, which entirely prevent natural abdominal breathing. The age of the patient did not appear to influence the clinical improvement as much as did the duration of the disease. Indeed, it is surprising to observe the degree of chest mobility and diaphragmatic movement obtained in some of the elderly patients.

In comparing the control group, in which treatment was specially selected, with the group treated by breathing exercises alone, the proportion of good results is seen to be practically the same. This, in our opinion, points to the value of breathing exercises as a practical form of therapy, since equally good results were obtained with this simple treatment as with the more complicated and specific measures practised in the control group.

When the movements of the diaphragm and epigastrium are considered in relation to the clinical results, it appears that patients with good movements originally did better than those with poor movements; if, however, the latter acquired good movements the clinical condition was also for the most part improved. For success it is necessary to obtain: (*a*) A chest expansion at the fourth rib of at least 2½ in. (*b*) An epigastric expansion of at least 2 in. (*c*) A good diaphragmatic excursion during normal breathing. (*d*) Complete control over the full range of diaphragmatic movement. (*e*) The ability to dissociate thoracic from abdominal breathing at will. In addition to these purely physical aspects, there is also a psychological aspect of this treatment: (*a*) The patient is encouraged to aim at aborting the attacks by the exercises. (*b*) It is thereby suggested that the treatment lies in his own hands. (*c*) This régime entails a certain amount of perseverance and effort on the part of the patient and is therefore excellent discipline.

SUMMARY

(1) In 75 cases of asthma treated for one year with expiratory breathing exercises, good clinical results were obtained in 52, improvement in 12, and no improvement in 11 cases.

(2) The improvement seemed to depend upon the patient acquiring mobility of the chest, natural diaphragmatic breathing, and control of the diaphragm. There is also a considerable psychological factor.

(3) The treatment requires perseverance and effort on the part of both patient and teacher over a considerable time.

(4) A number of patients were able to abort impending attacks by these exercises; this appeared to be due to loosening and expulsion of mucus, rather than to any other factor.

(5) This method of treatment is simple and applicable in all cases; it is sound treatment from the physiological point of view. In this series 11 out of 75 cases were unable to learn diaphragmatic control.

(6) In spite of the fact that good results are claimed from breathing exercises alone, it is held that specific treatment should not be neglected—e.g., removal of feathers, foods, and so forth—or operation in gross nasal disease.

Our thanks are due to Miss Dorothy Hague who founded the Hague Asthma Research Scholarship, which one of us (M. G.) has held, and to the anonymous donors who provided funds for the apparatus and general expenses. We are especially grateful to Miss C. I. Mackness of the almoner's department and to Mrs. M. K. Stratford and Miss J. M. Reed of the physiotherapeutic department, whose perseverance and hard work have been invaluable.

Lastly we thank the patients forming the subject of this reasearch, who have undergone, without complaint, the discomfort associated with the repetition of the various investigations.

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STABILISATION OF THE ACROMIOCLAVICULAR JOINT

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THE acromioclavicular joint is essentially stable and secure, owing these qualities not so much to the capsular ligament investing the joint as to the coracoclavicular ligament, an extracapsular ligament which has no direct connexion with the joint itself. Were it not for the conoid and trapezoid ligaments, the component parts of the costoclavicular ligament, this joint would be relatively weak and dislocation would of necessity occur frequently. The anterior components of the trapezius and deltoid muscles attached above and below the outer end of the clavicle respectively, help to stabilise the joint further.

ANATOMY

The articular surfaces of the clavicle and acromion respectively are cartilage-clad, ovoid areas, the long axis of which is from before backwards. Further, the articular surfaces are so inclined that the clavicular surface looks downwards and outwards, while that of the acromion faces upwards and inwards. The ligamentous capsule investing the joint is complete, but is somewhat thicker above and below than it is in front and behind. Between the two articular surfaces is a very variable interarticular disc which is usually incomplete, but in rare cases may be complete and then subdivides the joint into two independent synovial cavities. Owing to the configuration of the two articular surfaces, in the form of two inclined planes opposed one to the other, the outer end of the clavicle is liable to be so relatively displaced as to ride upwards and outwards upon the acromion. This may occur without any disturbance of the coracoclavicular ligament, and results in a partial dislocation or subluxation of the joint.

Should the region of the point of the shoulder be the seat of very severe trauma, the outer end of the clavicle is usually fractured. Occasionally, however, complete dislocation of the joint, which can only occur when the coracoclavicular ligament is ruptured and the neighbouring muscle damaged, results (Fig. 1). In such cases the outer end of the clavicle may be displaced: (1) upwards; (2) backwards and downwards; (3) forwards and downwards;

(4) backwards, depending upon the direction in which the dislocating force is applied. In complete dislocation the outer end of the clavicle is most commonly displaced upwards, an accident which may result from a sudden violent thrust impinging downwards upon the acromion, and often accentuated by contraction of the trapezius muscle. If the severity of the dislocation is uncertain, the injury should be examined radiographically in order to determine whether the coracoclavicular ligament is ruptured or not. When this ligament is ruptured, a small flake of bone torn from the under side of the clavicle is often visible in the radiogram.

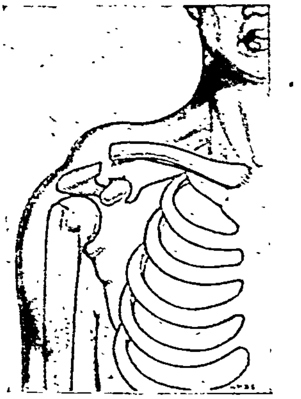

FIG. 1.—Drawing from a skiagram showing a complete dislocation of the acromioclavicular joint.

TREATMENT

Subluxation of the coracoclavicular joint, when the outer end of the clavicle is displaced upwards and outwards upon the acromion, is easily reduced. The shoulder should be raised and carried backwards while the outer end of the clavicle is subjected pressure downwards. The arm is placed at the s
a piece of padded leather is placed over the joir
a broad piece of strapping is applied w
at the elbow; its two ends are ca
and one behind, up to the sh
made to overlap the pad
injured joint. The arm
a bandage. The stra
place three weeks, a
should be kept in
Subluxation is liab
disability is usuall

In cases where
to the rupture c
in those cases
an operation g

The joint i
passing thr
muscle. T
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silver
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rounded
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a knot which
the deltoid mus
a few interrupt
deltoid muscle-fib
skin with a continu
are applied and th
a week; after this
patient is encourage
possible.

E

Although I have
times since 1915, an
before I had the op
sis five years later. on whom I first operated. This prompted me to investigate the results of the other four cases.

Case 1.—A. B., aged 25, a baker, was thrown from his cart in October, 1914, when his horse bolted. He fell on to the point of his shoulder and on admission to hospital was found to have a dislocation of the outer end of his clavicle. This was confirmed by radiography, and the joint was immobilised with strapping. After three weeks the strapping was removed and the patient wore a sling for two weeks while he attended for massage and electrical treatment. He returned to work in December, some seven weeks after his accident, but soon found that he could not do any work in the bakery which necessitated using his shoulder muscles, as the bone became displaced and hurt him. H was examined again in January, 1915, and found to ha complete dislocation of the acromioclavicular joint wing to the free mobility of the outer end of t it was decided to stabilise the joint by a wi unding the joint. This was performed ac ethod described above, and the patient hospital on the fifteenth day and w ks after his operation. In Januar rated upon for acute appendic y. His acromioclavicul o be absolutely stable ver had any troub years previou ult was could

						G.-ent.	
						,,	
						1931.	Perf.
						1926.	
				25·7		1925.	G.-ent.
				83·2		1923.	(*f*)
				26·5		1930.	
			Nil.	11·2		1931.	
			16·7	22·8		1923.	G.-ent.
			0·2	5·1		1918.	,,
			18·7	26·2		1923.	,, (*g*)
			26·7	50·8		1924.	
			3·0	3·0		1931.	
		2	15·0	37·9		1919.	
		3	17·4	17·4		1929.	
		2	Nil.	2·0		1929.	
		3	,,	18·1		1924.	G.-ent.
		15	14·8	19·0		1929.	
		37	0·9	29·2		1926.	G.-ent.
		56	4·0	26·6		1923.	G.-jej.
		80	19·2	32·1		1922.	,,
		8	5·6	20·3		1927.	
	5	3	5·8	20·8		1929.	
	2	11	20·2	32·5		1921.	
	5	15	1·0	16·4		1925.	G.-ent.
	7	25	14·1	29·3		1927.	,,
	5	17	9·4	28·8		1929.	
	4	18	97·7	100·2		1928.	
	15	12	2·2	5·5		1919.	Perf.
	12	7	5·2	6·8		1923.	
2	9	18	Nil.	13·9		1925.	
47	5	15	19·4	27·6		1929.	G.-ent.
44	7	8	0·3	54·0		1925.	,, (*h*)
39	7	8	1·6	4·0		1922.	
43	12	37	6·5	18·0		1923.	
36	14	28	5·6	37·1		1920.	LPT
38	12	23	2·2	10·1		1922.	Perf.
39	10	18	4·3	10·4		1924.	
31	15	28	1·7	9·9		1919.	
16	8	73	36·4	55·6		1926.	
	3	9	62·0	87·0		1931.	G.-ent.
	5	31	8·0	25·0		1929.	,,
	8	10	Nil.	4·7		1926.	,,
	7	28	44·3	63·3		1920.	
		3	Nil.	8·3		1931.	G.-ent.
		9	,,	20·3		1925.	Perf.
		12	24·0	47·0		1925.	,,
		15	0·2	14·6		1923.	
		29	Nil.	26·4		1924.	Perf.
		6	64·0	67·0		1926.	
		59	5·0	49·8		1924.	
		14	1·1	6·0		1923.	
		3	22·3	24·0		1932.	
		2	Nil.	6·2		1929.	
		4	,,	9·8		1923.	G.-ent.
		2	,,	0·7		1926.	
		5	2·6	25·1		1923.	
		4		53·3		1928.	
		6		24·8		1928.	
		5		6·0		1931.	
		2		7·9		1921.	
		2				1924.	
		3				1928.	Perf.
		5					
		7					

				5				
		7		6				
				12				
		4		9				
		8		37	21			
		13		22	8·6			
NON-MANUAL WORKE								
			7	18	29·4			
		8	5	11	Nil.	89·		
		53	3	24	14·0	22·0		
		41	3	·9	11·3	145·0		
		50	9	3	Nil.	1·5		
		50	5	19	15·8	44·8	192	
		51	3	4	125·7	130·0	1927.	
	M.	52	8	5	0·5	3·4	1918.	
	M.	31	11	3	Nil.	4·4	1923.	
128	F.	29	10	35	4·7	12·4	1924.	G.-e
129	M.	31	10	10	16·8	18·3	1924.	
130	M.	32	11	12	Nil.	5·9	1923.	G.-ent.
131	M.	39	14	31	16·3	29·6	1920.	Perf.
132	M.	28	8	19	12·7	27·1	1923.	
133	M.	49	10	14	Nil.	9·6	1923.	G.-jej.
134	M.	43	10	10	9·3	11·4	1924.	
135	M.	42	5	2	0·2	0·4	1929.	
136	M.	40	10	42	26·8	34·9	1925.	
137	M.	31	7	38	42·6	52·3	1928.	G.-ent.
138	M.	37	5	2	Nil.	2·2	1930.	,,
139	M.	37	20	11	,,	9·5	1913.	,,
140	M.	45	13	7	8·5	12·5	1921.	G.-jej.
141	M.	49	4	21	58·0	84·5	1929.	Perf.
142	F.	42	17	32	5·8	14·5	1916.	G.-ent.
143	M.	35	14	13	9·6	15·1	1921.	
144	M.	30	6	5	12·5	13·0	1929.	G.-ent.
145	M.	24	11	9	Nil.	4·4	1924.	
146	M.	47	10	9	,,	15·4	1924.	
147	M.	47	11	20	4·6	21·5	1924.	
148	F.	50	3	12	23·7	30·7	1931.	G.-ent.
149	F.	22	10	19	0·8	22·6	1924.	,,
150	M.	42	9	17	2·0	19·1	1925.	,,
151	M.	33	16	95	29·1	40·8	1918.	,, (*k*)
152	M.	33	13	90	20·3	31·0	1920.	,, (*l*)
153	M.	31	12	39	7·0	8·7	1923.	G.-ent.
154	M.	40	13	14	2·8	7·1	1921.	,,
155	M.	48	6	7	12·3	13·5	1929.	,,
156	M.	44	12	11	Nil.	4·7	1922.	,,
157	M.	37	16	26	0·4	6·4	1918.	
158	M.	34	13	23	13·1	17·2	1922.	G.-ent.
159	M.	40	11	70	9·7	19·0	1923.	,,
160	M.	44	14	13	Nil.	50·5	1917.	
161	M.	40	11	4	,,	2·1	1923.	G.-ent.
162	M.	20	9	21	5·5	10·1	1926.	,,
163	M.	20	8	9	0·4	2·4	1926.	,,
164	M.	40	12	11	4·0	11·5	1922.	Perf.
165	M.	52	8	3	Nil.	4·4	1924.	G.-ent.
166	M.	40	15	13	6·1	16·6	1920.	(*m*)
167	M.	42	9	8	Nil.	2·4	1925.	G.-ent.
168	M.	34	11	25	,,	8·9	1923.	,,
169	M.	40	8	5	0·1	0·6	1925.	,,
170	M.	36	15	57	1·1	11·5	1919.	
171	M.	31	7	14	0·6	18·6	1926.	
172	M.	50	9	2	4·8	5·1	1925.	
173	M.	54	5	8	Nil.	28·8	1930.	
174	M.	37	12	5	7·2	9·7	1922.	
175	M.	54	3	6	Nil.	42·0	1924.	G.-ent.
176	M.	45	5	8	6·8	18·6	1928.	
177	M.	56	4	7	8·5	18·0	1926.	
178	M.	54	5	22	5·6	38·8	1925.	
179	M.	39	12	10	0·2	6·0	1923.	
180	M.	50	8	3	Nil.	2·2	1926.	G.-ent.
181	M.	46	10	2	,,	1·2	1925.	
182	M.	43	6	5	7·7	10·8	1929.	
183	M.	34	11	28	21·1	30·9	1923.	Perf.
184	M.	49	10	51	19·6	42·0	1923.	
185	M.	41	8	7	1·7	5·6	1926.	
186	M.	42	10	5	1·0	3·7	1924.	Perf.
187	M.	42	10	14	5·4	11·6	1924.	
188	M.	40	15	27	8·7	21·1	1920.	
189	M.	37	13	43	20·2	31·7	1921.	G.-ent.
190	M.	33	15	14	4·9	6·5	1919.	
191	M.	46	9	5	Nil.	1·9	1925.	
192	M.	38	12	23	8·1	20·2	1922.	
193	M.	35	8	13	0·1	3·7	1926.	G.-ent.
194	M.	45	10	12	0·9	6·7	1925.	
195	M.	40	8	4	Nil.	15·4	1926.	
196	M.	52	7	14	22·0	34·0	1923.	
197	M.	40	14	16	7·4	17·4	1920.	
198	M.	44	6	1	Nil.	1·3	1929.	G.-ent.
199	M.	38	8	22	28·7	35·7	1926.	
200	M.	42	8	19	19·6	21·7	1926.	

From Table I. it will be seen that the average subsequent yearly sick absence of the manual group was 15·6 days for digestive disorders and 28·7 days for illness of all sorts. For the non-manual group the average was 9·4 days for digestive disorders and 21·1 days for illness of all sorts. Of the whole group of 200 cases 24 per cent. incurred an average subsequent yearly incapacity for work of less than a week; 16 per cent. of from 7 to 14 days; 26·5 per cent. of from 14 to 28 days; and 33·5 per cent. of more than a month.

From Table II. it will be seen that the average subsequent yearly sick absence of the manual group was 12·5 days for digestive disorders and 26·1 days for illness of all sorts. For the non-manual group the average was 10·5 days for digestive disorders and 16·2 days for illness of all sorts. Of the whole group of 40 cases, 11 incurred an average subsequent yearly incapacity for work of less than a week; 8 of from 7 to 14 days; 12 of from 14 to 28 days; and 9 of more than a month.

From Table III. it will be seen that the average subsequent yearly sick absence of the manual group was 15·5 days for digestive disorders and 26·9 days for illness of all sorts. For the non-manual group the average was 10·7 days for digestive disorders and 19·7 days for illness of all sorts. Of the whole group of 150 cases 24 per cent. incurred an average subsequent yearly incapacity for work of less than one week; 16·7 per cent. of from 7 to 14 days; 29·3 per ce of from 14 to 28 days; and 30 per cent. of more tl a month.

TABLE II.—DUODENAL ULCERS MEDICALLY TREATED

(A) MANUAL WORKERS (21 Cases)

Case.	Sex.	Age at diagnosis.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of confirmation of diagnosis and remarks.
1	M.	49	6	20	53·8	73·5	1928.
2	M.	41	3	9	14·0	44·0	1931. P.T. (*n*)
3	M.	45	9	43	10·5	24·5	1925.
4	M.	43	4	8	28·2	91·2	1930.
5	M.	31	4	4	10·7	15·2	1930.
6	M.	34	5	Nil.	Nil.	Nil.	1930.
7	M.	41	4	7	"	10·2	1930.
8	M.	42	11	39	16·7	24·4	1924.
9	M.	35	4	5	0·2	3·5	1931.
10	M.	35	15	12	4·3	8·9	1919.
11	M.	36	8	3	1·4	6·5	1926.
12	M.	41	10	23	0·3	2·7	1924.
13	M.	32	10	12	2·4	6·7	1922. G.-ent. (*o*)
14	M.	53	7	5	0·7	1·1	1925.
15	M.	35	6	21	17·7	55·3	1928.
16	M.	35	9	6	Nil.	8·1	1925.
17	M.	41	8	44	27·6	56·9	1923. G.-jej. (*p*)
18	M.	19	9	21	7·5	19·1	1925.
19	M.	43	6	29	15·5	34·8	1928.
20	M.	41	3	5	47·7	47·7	1931.
21	M.	45	10	35	3·6	15·0	1924.

(B) NON-MANUAL (19 Cases)

Case.	Sex.	Age at diagnosis.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of confirmation of diagnosis and remarks.
22	M.	43	4	10	4·7	8·7	1931.
23	M.	45	5	1	Nil.	1·0	1930.
24	M.	42	5	2	6·4	8·4	1930.
25	M.	46	3	5	Nil.	1·6	1931.
26	M.	48	11	16	14·6	15·1	1923.
27	M.	37	12	56	17·3	35·3	1922.
28	M.	35	7	1	Nil.	3·7	1928.
29	M.	32	14	8	6·1	7·2	1919.
30	M.	51	5	4	2·8	4·6	1929.
31	M.	42	8	4	Nil.	17·0	1926.
32	M.	57	3	1	24·3	24·3	1930.
33	M.	39	12	14	Nil.	9·5	1922.
34	M.	37	9	13	4·8	15·4	1923. Op. (*q*)
35	M.	42	3	9	87·0	87·0	1929. G.-ent. (*r*)
36	M.	27	11	20	1·1	9·5	1924.
37	M.	38	5	18	5·0	19·8	1925. G.-ent. (*s*)
38	M.	40	5	4	0·8	5·8	1929.
39	M.	46	8	5	14·6	15·9	1926.
40	M.	48	12	12	10·0	18·6	1923.

(*n*) Developed pulmonary tuberculosis.

(*o*) Gastro-enterostomy ten years later. Subsequently developed pulmonary tuberculosis.

(*p*) Gastro-jejunostomy eight years later.

(*q*) Operation nine years later.

(*r*) Gastro-enterostomy three years later.

(*s*) Gastro-enterostomy five years later.

TABLE IV.—GASTRIC ULCERS MEDICALLY TREATE

(A) MANUAL WORKERS (30 Cases)

Case.	Sex.	Age at diagnosis.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of confirmation of diagnosis and remarks.
1	M.	49	4	15	5·2	10·2	1928.
2	M.	43	4	5	11·7	12·2	1926.
3	M.	37	4	12	39·2	43·5	1931.
4	M.	34	21	17	7·6	14·4	1913.
5	M.	48	4	15	74·5	83·5	1930.
6	M.	46	4	25	75·7	85·0	1931.
7	M.	35	5	15	3·3	7·8	1929.
8	M.	46	5	2	Nil.	3·4	1929.
9	M.	34	4	25	9·0	22·0	1930.
10	M.	37	3	12	25·0	76·0	1931.
11	M.	30	5	17	0·6	18·4	1929.
12	M.	45	9	39	27·2	42·1	1926.
13	M.	42	5	18	2·6	35·2	1929.
14	M.	35	5	15	4·2	5·4	1930.
15	M.	50	6	20	11·8	12·0	1929.
16	M.	35	13	11	0·2	12·7	1922.
17	M.	34	16	53	1·9	8·6	1916.
18	M.	51	3	6	39·3	47·7	1930.
19	M.	39	10	45	35·3	40·1	1925.
20	M.	32	9	33	20·1	27·2	1926.
21	M.	52	7	15	2·1	21·0	1925.
22	M.	47	11	10	0·3	9·6	1924.
23	M.	33	15	35	3·4	15·3	1919.
24	M.	42	9	11	6·5	9·1	1925.
25	M.	42	3	5	0·3	20·0	1932.
26	M.	23	11	33	22·4	26·4	1923. G.-ent.
27	M.	38	6	9	22·0	58·6	1923.
28	M.	51	5	14	13·4	50·0	1929.
29	M.	41	11	8	1·6	10·6	1923.
30	M.	35	4	10	27·5	74·5	1929.

(B) NON-MANUAL (10 Cases)

Case.	Sex.	Age at diagnosis.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of confirmation of diagnosis and remarks.
31	M.	45	6	10	18·0	29·3	1920.
32	M.	49	4	6	7·7	9·5	1931.
33	M.	34	6	21	Nil.	8·5	1928.
34	M.	48	7	19	14·3	18·6	1928.
35	M.	47	10	17	7·6	20·4	1924.
36	M.	31	10	51	36·3	48·6	1924.
37	M.	50	9	9	0·3	5·1	1923.
38	M.	49	10	26	16·7	40·6	1921.
39	F.	30	15	57	18·3	29·3	1920.
40	M.	37	13	9	2·0	4·5	1922.

(*ll*) Gastro-enterostomy for pyloric stenosis 7½ years late

From Table IV. it will be seen that the aver subsequent yearly sick absence of the manual gr was 16·4 days for digestive disorders and 30 d for illness of all sorts. For the non-manual gr the average was 12·1 days for digestive disorders 21·4 days for illness of all sorts. Of the whole gr of 40 cases, 4 incurred an average subsequent ye incapacity for work of less than a week; 11 of fr 7 to 14 days; 10 of from 14 to 28 days; and 1 more than a month.

It has been impossible, owing to exigencies of spac print in detail in the tables each individual sick rec but the number of separate occasions, during the y of observation, given in the fifth column, will help to su some idea of the distribution of the sick absence. very large proportion of the cases observed it was more or less uniform character throughout the obse years.

GENERAL CONCLUSIONS

In so far as the above groups can be consid representative, it would appear that, while there many individual instances of subsequent good he the general expectation of working incapacity in c of proved duodenal and gastric ulceration—how of proved duodenal and gastric ulceration—how treated, and under ordinary industrial conditio is definitely high.

Thus of the 430 cas[illegible] under observation 31·6 cent. incurred an av[illegible] sequent yearly incapa for work of [illegible] onth; 27·7 per cen

TABLE III.—GASTRIC ULCERS SURGICALLY TREATED

(A) MANUAL WORKERS (107 Cases)

Case.	Sex.	Age at operation.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of first operation and remarks.
1	M.	47	4	6	6·7	12·2	1927.
2	M.	38	4	19	5·5	67·7	1922.
3	M.	45	4	13	61·0	84·5	1926. Perf.
4	M.	48	3	7	52·7	61·0	1926. ,, (t)
5	M.	56	3	3	Nil.	8·0	1922. G.-ent.
6	M.	55	4	8	5·2	6·5	1928.
7	M.	36	15	31	17·7	24·7	1907. Perf.
8	M.	38	4	8	Nil.	14·2	1924.
9	M.	45	5	1	,,	0·2	1923.
10	M.	48	4	5	13·5	23·2	1926.
11	M.	31	11	30	10·3	56·4	1913. G.-ent.
12	M.	43	10	15	17·3	19·7	1920.
13	M.	54	5	14	Nil.	14·6	1929. G.-jej.
14	M.	52	4	27	40·0	49 0	1930.
15	M.	36	7	37	18·1	20·1	1927. Perf.
16	M.	41	8	31	12·5	16·9	1926. ,,
17	M.	43	8	8	0·9	3·0	1926. G.-ent.
18	M.	47	9	21	19·8	23·1	1926. ,, [ent.
19	M.	47	9	13	Nil.	4·3	1925. Perf. G.-
20	M.	43	9	23	33·5	35·8	1925. Perf. (u)
21	M.	37	5	9	Nil.	17·4	1929. Part. gast.
22	M.	31	20	28	1·5	5·7	1914. Perf.
23	M.	37	13	13	12·3	15·7	1922. Perf. (v)
24	M.	43	11	22	1·0	14·5	1923. G.-ent.
25	M.	48	3	1	Nil.	0·3	1931. ,,
26	M.	39	9	26	26·9	29·3	1925.
27	M.	29	9	10	1·0	8·1	1925. Perf.
28	M.	46	12	14	11·6	16·8	1923.
29	M.	47	6	16	1·0	7·0	1929.
30	M.	49	9	8	Nil.	10·7	1925. G.-jej.
31	M.	53	7	8	0·1	24·1	1923. G.-ent.
32	M.	39	12	37	12·8	21·6	1923.
33	M.	44	3	2	1·0	4·7	1932. Perf.
34	M.	48	3	7	43·3	61·0	1932. ,,
35	M.	30	7	6	Nil.	3·3	1927. ,,
36	M.	51	9	14	8·9	16·5	1924. G.-ent.
37	M.	41	10	25	34·0	44·2	1924. Perf.
38	M.	35	10	8	4·1	10·6	1924. ,,
39	M.	27	10	7	2·0	2·1	1924.
40	M.	48	9	2	Nil.	0·7	1926. Perf.
41	M.	34	3	13	102·7	110·0	1932. G.-ent.
42	M.	30	18	83	2·5	14·6	1915. ,,
43	M.	50	4	10	72·7	73·5	1928.
44	M.	34	6	10	1·7	2·0	1929.
45	M.	35	8	55	24·0	42·6	1922. (w)
46	M.	51	7	27	4·3	11·6	1927. Perf. (x)
47	M.	36	10	58	8·4	24·1	1918.
48	M.	42	8	39	15·9	29·8	1927. G.-jej.
49	M.	42	17	13	0·3	3·1	1917. [(y)
50	M.	33	10	16	23·4	26·6	1924. Part. gast.
51	M.	42	11	24	18·4	22·5	1924. (z)
52	M.	38	12	43	19·1	51·6	1920. G.-ent.
53	M.	42	5	2	1·2	1·2	1928.
54	M.	49	5	4	Nil.	0·8	1929.
55	M.	45	11	36	3·9	24·2	1923. G.-ent.
56	M.	46	8	9	1·5	17·2	1926. ,,
57	M.	40	10	18	61·6	64·1	1924.
58	M.	28	14	45	12·4	22·6	1920. Perf.
59	M.	39	12	47	21·4	28·7	1922.
60	M.	41	7	24	Nil.	10·4	1927. Perf. G.-jej.
61	M.	49	3	30	88·0	127·0	1931. Perf. (aa)
62	M.	41	19	9	0·6	3·1	1916. Perf.
63	M.	33	7	11	3·0	7·4	1927.
64	M.	50	7	17	8·4	39·7	1926.
65	M.	33	10	8	2·4	9·8	1925. G.-ent.
66	M.	42	7	41	27·3	70·0	1924. ,,
67	M.	42	8	39	96·5	99·8	1921. ,,
68	M.	55	5	6	2·6	4·4	1929. ,,
69	M.	47	7	30	92·3	102·0	1926.
70	M.	40	9	21	1·5	17·0	1926. G.-ent.
71	M.	45	6	14	1·8	62·5	1926. Perf. (bb)
72	M.	45	10	16	17·9	39·1	1923. G.-ent. Died. C.V.
73	M.	38	11	11	0·5	1·7	1923.
74	M.	43	8	28	12·9	51·0	1926. G.-ent.
75	M.	42	8	12	0·2	4·9	1926. Perf.
76	M.	31	4	31	40·7	57·2	1927. ,,
77	M.	27	8	Nil.	Nil.	Nil.	1926. Perf.
78	M.	36	14	34	5·2	7·9	1918. G.-jej.
79	M.	26	5	9	6·4	27·6	1926.
80	M.	43	14	6	Nil.	0·8	1920.
81	M.	34	12	12	18·0	37·9	1922.
82	M.	36	11	33	0·7	6·2	1924.
83	M.	42	8	16	24·0	42·7	1922.
84	M.	42	17	45	23·2	45·0	1915. Perf.
85	M.	31	15	12	Nil.	3·0	1920. ,,
86	M.	42	9	28	9·0	18·2	1926. ,,
87	M.	36	9	10	6·9	11·8	1925.
88	M.	49	7	18	27·6	66·6	1922.
89	M.	26	10	18	9·6	13·0	1924. G.-ent.
90	M.	31	6	6	4·2	9·5	1929. Perf. (cc)
91	M.	25	9	7	0·1	7·3	1925.
92	M.	27	10	30	2·4	7·2	1925.
93	M.	46	11	24	7·9	20·2	1923.
94	M.	32	4	14	9·5	26·0	1930.
95	M.	45	8	24	10·2	35·2	1926. [ent.
96	M.	38	3	4	72·3	72·3	1932. Perf. G.-
97	M.	29	4	13	2·2	6·5	1930. Part. gast.
98	M.	42	8	21	1·0	21·1	1926. Perf.
99	M.	31	8	12	44·9	47·6	1926. ,, (dd)
100	M.	31	8	20	0·6	4·1	1926.
101	M.	32	12	69	5·3	13·9	1922.
102	M.	49	4	16	67·5	74·2	1930.
103	M.	38	11	26	1·9	20·3	1923. G.-ent.
104	M.	40	10	34	0·2	36·1	1919.
105	M.	43	8	22	2·0	10·3	1926.
106	M.	47	12	17	11·2	16·2	1920.
107	M.	33	10	40	25·3	36·5	1924. G.-ent.

(B) NON-MANUAL (43 Cases)

Case.	Sex.	Age at operation.	Years of subsequent observation.	Total number of sick absences.	Average annual sick absence for digestive disorders.	Average annual sick absence from all causes.	Date of first operation and remarks.
108	F.	51	8	19	2·0	6·6	1918. [ent.
109	M.	56	3	Nil.	Nil.	Nil.	1923. Perf. G.-
110	F.	51	3	9	1·7	22·0	1925.
111	F.	53	7	3	Nil.	2·6	1920.
112	M.	51	6	10	14·8	19·2	1920. (ee)
113	F.	32	4	18	1·7	78·0	1914. G.-ent.
114	M.	44	9	9	16·4	17·5	1925. (ff)
115	M.	50	3	5	42·3	47·0	1927.
116	M.	39	12	3	5·5	5·6	1922. Perf. (gg)
117	M.	43	13	17	Nil.	16·1	1922. G.-ent.
118	M.	34	7	25	1·0	10·4	1927.
119	M.	46	12	20	10·5	29·7	1922.
120	M.	35	5	7	0·8	5·4	1930.
121	F.	44	11	19	16·0	17·8	1918.
122	M.	35	8	19	40·0	42·4	1927. G.-jej. (hh)
123	M.	46	11	10	1·5	10·4	1920. G.-jej.
124	M.	25	14	8	Nil.	2·6	1919. Perf.
125	M.	33	16	17	1·1	3·7	1918. ,,
126	M.	28	5	20	74·6	76·4	1926.
127	F.	31	5	15	9·4	14·2	1928.
128	M.	40	5	15	0·2	26·8	1930. Perf.
129	M.	38	11	26	10·4	14·3	1923. G.-ent. (ii)
130	M.	40	4	4	Nil.	5·0	1930.
131	M.	18	4	1	,,	2·0	1931. Perf.
132	M.	30	6	2	10·5	14·3	1928. G.-ent. (jj)
133	M.	53	6	41	42·3	47·3	1926. G.-ent. (kk)
134	M.	29	10	30	2·6	11·8	1924. G.-ent.
135	M.	35	10	20	24·7	26·2	1924.
136	M.	55	5	4	0·4	18·0	1929. G.-ent.
137	F.	19	7	8	Nil.	6·1	1926.
138	M.	44	14	28	4·6	8·8	1919.
139	M.	25	10	23	0·4	9·4	1924. Perf.
140	M.	37	5	7	Nil.	5·2	1929.
141	M.	48	8	16	5·7	10·7	1926. Perf.
142	M.	31	3	1	Nil.	0·3	1931. ,,
143	M.	38	4	13	3·5	54·0	1922.
144	F.	37	11	7	26·7	29·0	1924.
145	M.	33	13	17	7·9	14·2	1921.
146	M.	36	11	3	8·4	28·4	1923.
147	F.	38	5	4	39·4	39·4	1929.
148	M.	40	10	23	18·9	21·4	1917.
149	M.	32	4	8	15·0	21·7	1930.
150	M.	38	16	7	Nil.	7·4	1918.

Part. gast. = partial gastrectomy. C.V. = carcinoma ventriculi.

(t) Second operation 12 months later. Gastro-enterostomy.

(u) Gastro-enterostomy. Second operation six years later. Partial gastrectomy.

(v) Duodenal ulcer three years later. Gastro-enterostomy.

(w) Contracted abdominal tuberculosis eight years later.

(x) Perforation (subacute).

(y) Sixteen months later, gastro-enterostomy.

(z) Second operation for adhesions eight years later.

(aa) Twelve months later gastro-jejunostomy for duodenal ulcer.

(bb) Pulmonary tuberculosis five years later.

(cc) Second operation for duodenal ulcer six years later.

(dd) Perforation five years later. Duodenal ulcer seven years after original operation.

(ee) Died after second operation six years later.

(ff) Operation for duodenal ulcer four years later.

(gg) Second operation 18 months later.

(hh) Second operation two years later.

(ii) Second operation one year later for perforation.

(jj) Second operation one year later.

(kk) Second operation 18 months later for duodenal ulcer.

from 14 to 28 days; 17·7 per cent. of from 7 to 14 days; and 23 per cent. of less than a week—the last-named, from the standpoint of regular working capacity, representing the undoubtedly good results.

Of the 200 cases in the duodenal operation series, 4 afterwards developed gastric ulcers, and 6 required a second operation for the original condition. Of the 40 duodenal cases medically treated, 5 required operative treatment later. Out of the whole group of 240 cases of duodenal ulcer, 4 afterwards developed pulmonary tuberculosis, a proportion large enough to suggest a generally lowered resistance.

Of the 150 cases in the gastric operation series, 6 afterwards developed duodenal ulcers and 9 required a second operation for the original condition; 1 developed pulmonary and 1 abdominal tuberculosis, and 1 carcinoma of the stomach.

It has sometimes been held, from a surgical point of view, that perforated cases, for some obscure reason, have a better subsequent record than others. But in the above groups this has not proved to be the case. In the duodenal operation series, the subsequent average annual sickness incurred in the perforated cases (24) was 16·1 days for digestive disorders and 29·3 days for illness of all sorts, as compared with 12·6 days for digestive disorders and 25 days for illness of all sorts in those where perforation had not taken place. In the gastric operation series the average annual sickness in the perforated cases (41) was 14·8 days for digestive disorders and 23·8 days for illness of all sorts, as compared with 13·9 days for digestive disorders and 25·2 days for illness of all sorts in those where perforation had not taken place.

Turning to the age-distribution, it will be seen that, of the 240 cases of duodenal ulcer, 48 were under thirty-five years of age when the condition was operated upon or otherwise confirmed, 137 between the ages of thirty-five and forty-five, and 55 were forty-six or over. Of the 190 cases of gastric ulcer, 51 were under thirty-five years of age when the condition was operated upon or otherwise confirmed, 85 were between the ages of thirty-five and forty-five, and 54 were forty-six or over. The condition in both series was therefore predominantly one of middle and later life. Although the average yearly sick absence incurred is very considerable in all groups, the type of work performed—manual or non-manual—appears to have a not unimportant bearing on the amount of such sick absence. It will be noted, in the whole series of cases, that manual workers had an average sick absence for all causes of approximately 8 days per year more than the non-manual employees.

Finally there is a general impression that irregularity in the hours of employment and consequently, to some extent, of meal-times may be a predisposing factor in the development of gastric and duodenal ulceration. It has not been possible in the above series to obtain exact data either in support or denial of this. But in this connexion an analysis of a year's sick absence in large groups of employees, made some years ago, may be of interest. In the year in question, 1926, the sick absence incurred from duodenal and gastric ulceration in a group of 70,000 men, mainly engaged upon irregular duties, as compared with such sick absence in a group of 12,000 men of approximately the same status, mainly engaged upon regular duties, was in the proportion of 7 to 6, thus indicating that this factor was probably considerably less important than is usually supposed.

We should like to record our thanks to all those who have assisted in the collection and preparation of the above figures, and particularly to Mr. A. W. Scott, of the Medical Branch of the Post Office.

PUNCTATE BASOPHILIA IN RHEUMATIC CASES AFTER CHRYSOTHERAPY

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Examination of a Leishman-stained blood film from a case of myelogenous leukæmia showed definite punctate basophilic and polychromatic cells. On reference to the case-sheet it was found that the patient had received numerous injections, and as she had been sent into this hospital as a rheumatic condition it seemed possible that gold preparations had been used, and that some of the abnormal red cells might be due to this cause. Her private doctor was consulted on this point, and at the same time other patients receiving or known to have received gold injections were examined. In each case punctate basophils and polychromatic cells were found in the blood.

THE BLOOD PICTURE

So far, 21 cases treated with gold preparations have been investigated and out of these 16 contained both punctate basophils and polychromatic cells; no abnormal erythrocytes have been observed in untreated cases. Toxic symptoms developed in 5 cases; gastro-intestinal disturbances in 4 cases; and albuminuria in 1 case.

As the possibility that these abnormal cells might be present was not appreciated until this accidental finding, the exact time of their first appearance in the blood could not be ascertained; but the more recent cases have been carefully investigated so as to determine the earliest possible moment at which these cells can occur in the course of treatment. Out of 5 patients receiving two injections each, with an interval of 1 week between each injection, polychromasia and punctate basophilia appeared in 4, the patient with no abnormal blood picture having albuminuria. Out of 5 patients receiving three injections each, with an interval of 1 week between each injection, polychromasia and punctate basophilia appeared in 4, the fifth being free from toxic symptoms. Thus it can be stated that these primitive cells can appear after a second, if not a first, injection of gold.

The length of time during which these cells persist in the blood following the last injection of gold has been more readily ascertained. In one case, two courses of gold were given and punctate basophils and polychromatic cells were found 5 months later; in another, after eight injections, the last being 3 months ago, the blood showed the same condition. Another patient to whom gold injections were given 10 months ago revealed abnormal cells, whilst a patient receiving gold 12 months ago showed no abnormality of the red cells. The evidence obtained up to the present thus indicates that these abnormal cells may persist for at least 10 months.

The gold preparations used in the cases examined were sanocrysin and myocrysin. Of 9 cases treated by myocrysin all showed polychromasia and punctate basophilia, whereas, of those treated by sanocrysin, only 1 showed abnormal cells and 1 albuminuria. The dosage given does not seem to influence the appearance of primitive cells; they were observed in 1 case after two injections, equivalent to 0·15 gramme of myocrysin. It is perhaps of interest to note that Gaul and Staud[1] were able to detect gold spectroscopically in the cutis after a dosage of 0·1 g. of gold.

Little deviation from the normal was found in the total red count and in the percentage of hæmoglobin following one or two injections of gold, except possibly for a slight reduction in the total red count which soon adjusted itself to its normal figure. In all the cases examined there was a reduction in the total white count, the average being 4000 to 5000 per 1 c.cm. with a decrease in the percentage of polymorphonuclear cells and a corresponding relative increase in the lymphocytes. The average number of punctate basophils per 100 white cells counted was 3 to 4 cells, but in one case the number in two consecutive counts with an interval of 4 days showed 31 punctate basophils per 100 white cells counted. This patient had received three injections of myocrysin, the total amount being 0·11 g. Polychromasia and punctate basophilia were observed in all the counts made. There were no primitive red cells other than those mentioned.

Attention has previously been drawn to the toxic effect of gold injections and to certain changes in the blood of patients undergoing gold treatment.[2]

The more important changes in the blood were: an increase in the coagulation and bleeding time as observed by Jacquelin and Allanic[3]; leucopenia, with a relative lymphocytosis and an increase in the percentage of eosinophils as observed by Archard and others[4]; and thrombopenia by Secher,[5] in one of whose cases the platelets were reduced to 22,000 per c.mm. following injections which totalled to 1·5 g. of sanocrysin. In his observations on the presence of punctate basophilia as a result of lead therapy for the treatment of malignant disease, Brookfield[6] found, in the early stages, a temporary anæmia due to the destruction of the red cells, this being most conspicuous immediately after the injection of lead and while it was circulating in the blood stream. He observed no change in the white cells and little effect, if any, on the platelet count.

Following the observation of Secher[5] that the effect of gold on the blood platelets is to produce thrombopenia, we have made platelet counts before and during gold treatment of rheumatic patients. In 36 counts no obvious change was observed although the total amount of sanocrysin used in some cases exceeded the figure of 1·5 g. quoted by Secher. Little importance can be attached to the leucopenia with a relative lymphocytosis already mentioned, since this is frequently found in chronic rheumatoid arthritis even before treatment with gold preparations. The highest percentage of eosinophils found in a gold-treated patient was 8, a value which we and others have found equalled in untreated cases.

EFFECTS OF GOLD AND LEAD COMPARED

There is a close relationship between lead and gold injections in that both produce a temporary anæmia; moreover, punctate basophils and polychromatic cells appear in the blood following minute doses, and even after the first or second injections, of heavy metals. Following the use of both gold and lead there is a tendency to return to normal after the injections have been stopped, although with gold preparations it may take nearly 12 months from the date of the last injection.

Various hypotheses have been suggested as to the effect of gold on the circulating blood. Bousser and Weil[1] state that it produces an intoxication of a specific nature in the blood itself or on the bacteria circulating in the blood which, so altered, produces a change in the elements composing the blood. Jacquelin and Allanic[3] suggest that some patients have an idiosyncrasy to gold. Our results have no bearing on the former hypothesis, and the fact that we have found abnormal red cells in a great majority of gold-treated cases lends no support to the suggestion of Jacquelin and Allanic.

In view of the similarity in the blood picture following lead gold therapy it is probable that gold, like lead, causes a local concentration of the basophilic substance which is normally evenly distributed, and so produces the punctate basophilia and polychromasia also found in immature cells. The changes produced by lead and gold are, however, probably reversionary and due to toxic degeneration. Secher[5] emphasises the advantage of using small doses of gold with long intervals between the injections, and we consider this to be a sound policy.

We express our indebtedness to Dr. C. W. Buckley, senior physician to the hospital, for access to many of his cases, to Dr. G. C. Pether for his help with the references, and to our technical assistant, Miss M. Harrison, for the examination of many of the blood films.

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2. Holmes, G.: Brit. Med. Jour., 1935, i., 58.
3. Jacquelin, A., and Allanic, A.: Le Sang, 1933, vii., 288.
4. Archard, C. H., Costa, F., and Cahen, R. Ibid., 1933, vii., 288.
5. Secher, K.: Traitement des maladies rhumatismales par la sanocrysine, Copenhagen, 1933.
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7. Bousser, J., and Weil, P.: Le Sang, 1932, vi., 825.

LIPIODOL AS A THERAPEUTIC AGENT

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THE value of lipiodol in diagnosis is now well recognised, but its beneficial effect on certain inflammatory conditions may not be generally appreciated. The following cases may encourage others besides myself to use it as a means of treatment.

THE FIRST CASE

A Hokien Chinese woman, aged 26, was admitted to hospital on Feb. 6th under Prof. J. S. English, complaining of severe pain in the joints of the arms and legs, starting about three months previously. Though present in all her joints, it was worst in the small joints of the hands and in both knees, constant, being without intermission. In the other joints there was a vague aching sensation. The knee-joints were maintained in extreme flexion and attempts at extension produced severe pain. There was no thickening of peri-articular structures. Movements at the right elbow-joint were restricted and the interphalangeal joints were in flexion with extension of the metacarpo-phalangeal joints. The thenar and hypothenar eminences of both hands were wasted, more on the right side. No thickening of the ulnar nerves was elicited and the tests for leprosy were negative.

The lower abdomen was found to be tender and she had amenorrhœa and foul-smelling vaginal discharge which dated back to an abortion three months before. The cervix was found to be eroded, the uterus retroverted and retroflexed but not enlarged. The appendages were prolapsed without thickening or tenderness. Vaginal smears showed Gram-negative and Gram-positive cocci in profusion. Nothing of note was discovered elsewhere in the body. There was no fever and the pulse-rate was normal.

prejudicing the life or well-being of mother or child. In this short series all the infants were delivered alive and well, with the exception of one fœtus which had no bone formation in the vault of the skull. There was no maternal morbidity and the incidence of laceration of the perineum was slightly less in those women whose delivery had been assisted by forceps. It has of course yet to be proved that these forceps are as harmless in the hands of the general practitioner as in those of an expert. The tendency of modern operative technique is to use mechanically efficient instruments, which the operator can control with little muscular exertion of his own. It might be argued also that a short light forceps would be of little use in expediting a case of tedious labour with early rupture of the membranes, slow dilatation, a large caput, and marked moulding. The caput may show but the skull may be still far from the perineum, held up perhaps by the ischial spines. These are the cases where forceps are really required, and where longer ones are, if not essential, certainly more conveniently applied.

The orthodox obstetrician will doubtless find much to say in his own defence. He may suggest that the practice in the particular home selected represents that not of the best but of the most fashionable obstetricians, and that these achieve and maintain their popularity by pandering to their clients' desire for a speedy and relatively painless delivery rather than one which offers the utmost degree of safety to mother and child. It may be said, too, that if London practice is mirrored by that in this particular home it falls short in excellence of that at other centres. But when all has been said in defence there will remain an uneasy feeling that there is a good deal of truth in the suggestion that forceps are used and probably will always continue to be used in order to expedite the final stages of a normal delivery. The expert obstetrician is not likely to be tempted to use a more powerful instrument at an earlier stage just because he has it in his bag. But the practitioner may well learn to have a far greater respect for the axis-traction forceps if the veto which forbids him to use it except in grave emergency is accompanied by permission to help the weary patient to complete her labour with an instrument which is adapted for that purpose only.

ANNOTATIONS

INFANT MORTALITY ONE HUNDRED YEARS AGO

THE absence of the systematic registration of births and deaths makes it difficult in this country to trace at all accurately the course of mortality before the founding of the General Register Office in 1837. The figures upon which most workers have relied have been those contained in the London Bills of Mortality. In New York the difficulties appear, according to a recent paper by Charles Bolduan and Louis Weiner,[1] to be equally acute and to have lasted to a much later date; the registration of births was not established there until 1853, and even then for many decades was notoriously incomplete. In computing the infant mortality-rates of the nineteenth century these authors have therefore had to make an estimate of the births at each point of time from the populations recorded at ages under five at the census enumerations, or to work from conjectured birth-rates in each decade.

The result of their calculations is somewhat surprising. During the early part of the nineteenth century they find that the infant mortality-rate was relatively low—about 120 to 140 per 1000. It then rose steadily to a maximum of about 230 during the 'sixties, since when there has been a continuous and steep decline to a rate of about 60 in recent years. The unexpectedly favourable rates of the beginning of the century might be due to incompleteness in the reported deaths, and the subsequent rise to an improvement in their registration. But satisfaction on that point needs local knowledge, and Bolduan and Weiner from their inquiries are satisfied that the prevalence of low rates during the earlier years must be accepted as a fact, although the actual figures can, of course, be regarded as only approximately correct. The local situation also supports, they suggest, the validity of the picture. In the first quarter of the nineteenth century manufacturing was relatively unimportant in New York, whose inhabitants were mainly devoted to trade and shipping, housing conditions were generally favourable, and immigration from overseas was not yet well under way. The second quarter brought profound changes. The growth of population accelerated, factories increased, the standard of living fell through the competition of the increasing immigrants, and overcrowding and insanitary housing became prevalent. These conditions lasted through the 'fifties and 'sixties and led to the foundation of the present Department of Health with its subsequent improvement in the environmental conditions of the city and in its mortality experience. Such changes in conditions make it reasonable, the authors suggest, to accept their conclusion from the statistics that the infant mortality-rate was no higher at the beginning of the nineteenth century than at its end. That conclusion would in all probability be true of London, but the changes in level throughout the hundred years shown by Bolduan and Weiner in New York were certainly not present in London. Apart from spasmodic fluctuations from year to year the rate showed very little movement. From 1841 to 1901 it lay fairly steadily between 150 and 170 per 1000, and Brownlee's study[2] of the Bills of Mortality suggests that it was very little higher (about 180 per 1000) at the end of the eighteenth century. During that century there seems little doubt that child mortality, and probably infant mortality, fell heavily. Brownlee's figures for the death-rate under two show a rate in 1791–1800 only, roughly, half that calculated for in 1731–40, while J. R. Edmonds, an early contributor to our columns,[3] reached the conclusion that the death-rate under five was in 1810–30 less than half its level in 1730–50.

The London and New York figures, therefore, show very little likeness to one another. The London infant mortality-rate was probably improving in the eighteenth century, showed very little change throughout the nineteenth, and began its precipitate decline, in common with the rest of the country, at the turn of the twentieth. The New York experience, on the other hand, shows in Bolduan and Weiner's figures a material worsening throughout the first half of the nineteenth century, followed by an unbroken improvement from 1870 onwards—a generation before the corresponding movement in London.

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[1] Jour. of Pediatrics, July, 1935, p. 55.

[2] Proc. Roy. Soc. Med., Sect. of Epidem., 1925.

[3] THE LANCET, 1835–36, i., 690.

TONSILLECTOMY

TONSILLECTOMY should now have been fashionable long enough for some agreement on its value to be reached. Dr. A. D. Kaiser, chief pediatrician to the Rochester General Hospital, New York, who has estimated that half the older children in the large American cities have had their tonsils out, found[1] that in a well-controlled group of over 2000 children whose tonsils had been removed, there did appear to be a slightly diminished incidence of scarlet fever and diphtheria, although there was an increased susceptibility to sinusitis, bronchitis, and pneumonia. Ulf Nordwall,[2] working at the Stockholm Hospital for Infectious Diseases, investigated the severity and complications of scarlet fever and diphtheria in groups of tonsillectomised and non-tonsillectomised children. For this purpose he classified his cases of scarlet fever into groups according to the extent and severity of the rash and the angina, and also according to the occurrence, number, and type of complications. He also made the wise provision of separating those cases in which extirpation of the tonsils was complete from those in which tonsillar remnants remained. From a total number of 104 tonsillectomised cases and 312 non-tonsillectomised controls, he concluded that not only had tonsillectomy failed to influence the severity of the onset as judged by the angina and the eruption, but also that there was no demonstrable influence on the complications with the possible exception of sinusitis, which appeared to be somewhat more frequent in the tonsillectomised patients. The figures relating to diphtheria had to be drawn from a smaller number of tonsillectomised patients, since most of the cases admitted to hospital suffering from diphtheria had intact tonsils. Over a six-year period, it was only possible to be certain of 71 tonsillectomised patients in a total of 1781 diphtheria admissions; these were compared with three times as many controls. The cases were divided into four groups, consisting of those with (1) mild reddening with or without small membranes on the tonsils; (2) more extensive membranes localised exclusively to the tonsils; (3) membranes extending beyond the tonsils but not covering extensive areas of the pharynx, and with some sign of virulence; and (4) signs of virulence and membranes covering large parts of the mouth and throat. Groups (1) and (2) were regarded as benign, (3) and (4) as malignant. The results showed that diphtheria of the pharynx was considerably more frequent amongst patients with tonsils than amongst those without, whereas nasal diphtheria was commoner amongst the latter; and that both malignant diphtheria and complications occurred much more often in the non-tonsillectomised cases. It would be curious if tonsillectomy proved to be more useful in the prevention and attenuation of diphtheria than in the prevention of the onset of complications of scarlet fever or rheumatism. With regard to the latter, Kaiser, in a recent summary[3] of the important points in the control of rheumatic disease in childhood, recording conclusions reached from a detailed study of 1200 rheumatic children, does not get us much further. All he can say from his material is that removal of the tonsils in children subject to attacks of tonsillitis or muscular pains will protect some children against the severe types of arthritis which have the highest mortality-rate in this disease. The figures available in this country[4] appear to support the American statistics. Although tonsillectomy is not as widely practised amongst the poorer classes, over 50 per cent. of public school boys have had their tonsils removed. The incidence of respiratory infections, sinusitis, and even catarrhal conditions appears to be, if anything, slightly higher amongst those who have been tonsillectomised than those who have not. In face of such evidence, there does appear to be a real need to temper the general optimism with which the operation is apt to be recommended.

BALANITIS

INFLAMMATORY conditions of the glans penis are often met with in practice, but medical text-books give little space to their description and not much help in distinguishing one form from another. In a recent review[5] Dr. John F. Madden enumerates various direct causes—namely, phimosis, congenital and acquired, trauma, chemicals, and non-specific bacteria. Erosive balanitis, which may lead on to gangrene and phagedena, has been shown to be caused by Vincent's spirochætes in symbiotic relationship with fusiform bacilli under anaerobic conditions. Favourable conditions for its production are the combination of a long tight prepuce with faulty hygiene. The disease is known to be inoculable from patient to patient, and for this reason it has been termed by Corbus and others "the fourth venereal disease." Dr. Madden takes the view that under suitable local conditions with lowered general resistance the disease may be produced by organisms normally present as saprophytes; it is therefore not necessarily venereal in origin. Balanitis due to the gonococcus without concomitant urethritis has been described, but must be very rare. Of the forms of balanitis occurring in the course of exanthematic diseases that associated with the early stages of syphilis is the most important. It is always imperative to exclude primary syphilis when balanitis is associated with phimosis. Cases have been recorded in which the primary stage has taken the form of a specific balanitis without demonstrable localised primary lesion, the so-called syphilis d'emblée. Balanitis associated with multiple pin-head erosions throughout the preputial sac may form the primary manifestation. Balanitis may also occur as part of the secondary stage of syphilis, especially as the result of extension to the glans penis and prepuce of a macular roseolar rash. The diagnosis of these conditions can usually be confirmed by microscopic demonstration of the *Spirochæta pallida* with darkground illumination, and this examination should never be omitted. Scabies, erythema multiforme, and various generalised eruptions due to internal medication are occasional causes of balanitis which fall into this group. Balanitis sometimes results from metabolic disorders, particularly diabetes mellitus; Dr. Madden states that some degree of balanitis is present in about 7 per cent. of all male diabetics. Retention of the sugar-laden urine in the preputia' sac gives rise to a secondary mycotic inflammator eruption. From the fact that this may be the first external indication of glycosuria, the importance of testing the urine for sugar in all cases of doubtful origin will be obvious. Other causes included in this group are the excretion of large amounts of phosphates, creatinine or urates in the urine, and ammoniacal fermentation due to incontinence or other cause. Certain local tissue changes may also give rise to balanitis. These conditions, which include kraurosis penis and leucoplakia penis, are relatively uncommon, but are important from the fact that they are known to be precancerous lesions. They are usually found in older men as the result of some chronic irritation. Dr. Madden describes a rare condition, balanitis xerotica obliterans, found in younger men, sometimes following circumcision for phimosis. Meatal narrowing may occur and complete occlusion of the urethra has been reported.

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[1] Children's Tonsils In or Out. London. 1932.

[2] Acta Pædiatrica, 1934, xv., 338.

[3] Bull. Trimestriel of the International Association for Preventive Pediatrics, 1935, ii., 13.

[4] Glover, J. A.: Post-Grad. Med. Jour., 1934, x., 12.

[5] Jour. Amer. Med. Assoc., 1935, cv., 420.

PLACENTAL EXTRACT IN MEASLES PROPHYLAXIS

THERE is, unfortunately, no reason to suppose that London will fail to experience within the next few months its biennial epidemic of measles, and although the value of convalescent or adult-immune serum in prophylaxis is fully accepted, it is unlikely that during the expected visitation the supply will prove anything like adequate to the demand. The difficulties which beset the collection of convalescent serum in sufficient quantities are obvious and perhaps insurmountable, but it should surely be possible by propaganda and organisation to secure in large numbers suitable donors of adult-immune serum. If, however, a reliable prophylactic were available which could be obtained more easily, the problems of public health departments during a measles epidemic would be greatly simplified. So far, measles-immune sera from other than human sources have not been proved to convey any appreciable protection, and the human donor has been the sole source of supply. Recently, however, the human placenta in its extra-corporeal phase has provided a promising alternative. On the ground of the known immunity of the new-born to the disease, C. H. McKhann and T. F. Chu [1] were the first to use placental extract in measles prophylaxis and, although its merits are not as yet fully attested, placental extract is issued commercially in the United States. The extract is prepared from the placentas of healthy white women with negative Wassermann and Kahn tests; the cord-blood must also show a negative W.R. The placentas are ground up and extracted with saline. The extract, freed from tissue and blood-cells, is precipitated with ammonium sulphate. The precipitate is dissolved in water, dialysed to remove salts, adjusted for protein-nitrogen content, and preserved with phenol. I. M. Levitas [2] has employed this preparation not only for prophylaxis but also for treatment in doses of from 1 to 2 c.cm. injected intramuscularly into the buttock. He records his opinion that the results in 25 out of 28 patients treated were excellent; but the 5 cases of which details are given provide no convincing evidence that placental extract is of any greater value in the *treatment* of measles than are convalescent or adult-immune serum, and these are now discredited as therapeutic agents. The prophylactic results reported by Levitas, however, are comparable with those obtained by innumerable observers with convalescent or adult-immune serum. Attenuation attempted in 18 children exposed in their homes, a much more severe test, as S. Karelitz and B. Schick [3] have pointed out, than exposure in a hospital ward, succeeded in 13 cases. In 2 of the children in whom exposure had been "moderate" only the attack failed to occur at all; in 3 there was failure to secure attenuation, attributed to exceptionally intimate exposure and late injection. In another experiment, 12 children, exposed in a hospital ward, were injected with a view to prevention, and no cases of measles resulted. Although none of the children were ambulatory, the nearest bed to the affected child was only about 3 feet from it, and thus if the neighbouring children were in fact susceptible and not already immune, this meagre allowance of space would seem to have provided ample chances of effective exposure. Placental extract is easy to obtain, and the removal of all save the globulin fraction makes it possible to get an extract effective in small dosage. Levitas injected 2 c.cm. for attenuation (1 c.cm. for an infant) and 3 c.cm. (he suggests 3 to 4 c.cm.) for prevention. But the dosage must clearly be tentative at this stage, since there is as yet no standardisation as ordinarily understood. One commercial product is standardised with diphtheria toxin, but since the antitoxic content of placental extract bears no definite relation to the amount of measles protective substance it does not help us much. Further, as McKhann, Green, and Coady [4] have shown, these two principles occur in varying amount in different parts of the extract. There is however a more important objection to placental extract as at present prepared—its liability to produce reactions, both local and general. These have been attributed in part to the presence in the extract of tissue proteins. The properties of placental extract are at the present time the subject of special investigation in this country, and for the moment most workers would agree with the view of the Council on Pharmacy and Chemistry of the American Medical Association [5] that the product is hardly beyond the experimental stage.

THE CHOICE OF A HEARING AID

THERE is at the present time an extensive sale of apparatus to deaf people, a large part of which is caused by the extravagant claims of unscrupulous purveyors. This has resulted in hearing aids falling into some disrepute, in spite of the attention which has been given to them in medical and scientific circles, and the very great benefit that an appropriate instrument may be to many deaf people, and to their friends. The National Institute for the Deaf has issued a pamphlet for the information of the deaf, entitled "The Choice of a Hearing Aid," with the joint approval of its own medical committee and the physiology of hearing committee of the Medical Research Council. The chief causes of deafness, and the types of instrument at present available, are briefly described in non-technical language, with very practical advice on purchase. The deaf are reminded that the National Institute keeps a list of firms who agree to comply with certain canons of commercial etiquette, and who also allow an extended home trial, if 5 per cent. of the value of the instrument be paid when it is not retained at the end of the period. The deaf are advised to read carefully any agreement before signing it, and are warned against certain widely advertised non-electrical "aids," for which the price asked for home trial exceeds the cost of manufacture. The maximum alleviation of deafness can be obtained by the combination of a suitable instrument with good lip-reading. No clinical or experimental evidence has been brought forward to suggest that the continued use of a hearing aid causes any increase in existing deafness; there is thus no scientific basis for a popular fallacy which prevents some deaf people from taking advantage of instrumental help. For the benefit of the deaf, this pamphlet should circulate as widely as the newspapers and books of postage stamps which carry deaf-aid advertisements into the corners of the earth. It can be obtained for threepence from the National Institute for the Deaf, 105, Gower-street, London, W.C.1.

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[1] Amer. Jour. Dis. Child., 1933, xlv., 475.

[2] Jour. Amer. Med. Assoc., August 17th, 1935, p. 493.

[3] Ibid., 1935, civ., 991; see also THE LANCET, 1935, i., 1161.

[4] Jour. Pediatr., 1935, vi., 693.

[5] Jour. Amer. Med. Assoc., August 17th, 1935, p. 510.

MR. PLOWS

William Henry Plows, a senior clerk in the office of the Examining Board in England of the Royal Colleges of Physicians and Surgeons, died on Monday last at Westminster Hospital after a severe operation at the age of 56. Many of those who have sat for the examinations of the Conjoint Board, or the primary F.R.C.S., will recall the dark short bespectacled figure at the table in the medical clinical room, or standing at the foot of the stairs with the glad news that "you have passed all right." There was, moreover, always a note of real sympathy in his "I am sorry to say that you have failed." Plows was appointed to the clerical staff at the Examination Hall in October, 1895, and would have completed 40 years of loyal and conscientious service next month. To many generations of examiners he will be remembered for his courtesy and imperturbability in all circumstances. Much of the smooth working of the examination system devised by the late Sir Frederic Hallett was due to Plows's grasp of detail and the scrupulous care which characterised all his work.

A DIETETIC LIBERTINE

THE snack bar has become such a popular type of restaurant in recent years that the merits and demerits of frequent rather than heavy meals deserve consideration. H. W. Haggard and L. A. Greenberg [1] have correlated the variation of physical efficiency in factory workers at different periods of the working day with variations in blood-sugar and respiratory quotients, finding that all three are low when work is done after a meagre breakfast or at periods long after a meal. In directing attention to the spacing of meals throughout the 24 hours rather than to the total quantity or quality of foodstuffs consumed they are really suggesting the propriety for normal citizens of a régime long recommended to sufferers from chronic gastric disorders. Dr. Bashford and Dr. Scott suggest (see p. 714) that the part played by irregular meals in the production of peptic ulcer may have been over-rated, but it is easy to believe that the general efficiency of the worker as a machine is promoted by frequent stoking. Dr. Izod Bennett, in a spirited defence of the primitive method of eating to satisfy hunger rather than the peal of the dinner bell, which we print on p. 749, stakes out a claim for freedom to eat what we like when we like. The constant warnings in the last two decades of the dangers of diseases which must follow the increasing artificiality of the people's food have not, he holds, been justified. The manufacturers of margarine for example, have had little difficulty in adding to their product those missing elements which made it inferior to dairy produce as a food, or in supplying a chemical factor of greater value in the treatment of diseases than a natural factor present in food. It is a salutary reminder from one whose professional work has been largely concerned with the disorders of the alimentary canal and has retained an outlook detached enough to poke fun impartially at the food faddist who seeks a cure for every ill in eccentric dietaries, at the new school of gourmets who revolt against standardised food, and at dietitians brave enough to distil from the cauldron of modern theories the essence of a hospital menu.

PATIENT AND DOCTOR

WHAT is the essence of a successful personal relationship between patient and doctor? Sir Henry Brackenbury, in a book reviewed elsewhere in this issue, gives the answer as mutual confidence and coöperation. Few, if any, will disagree with him though opinions may differ as to how that ideal is to be attained, and yet some have certainly deplored the passing of the pomp and circumstance which surrounded the Victorian doctor. The air of mystery made him more impressive and convincing to some patients at least. The modern doctor, on the other hand, who plays golf and slices into the rough may lose prestige thereby, it being inferred perhaps that, just as he foozles his drive, so may he foozle his diagnosis. Far better, it is urged, that the doctor should remain a figure somewhat aloof and mysterious with few social contacts outside his work. Every general practitioner encounters patients who are competitive rather than coöperative, with whom a consultation is a sort of viva-voce examination with the doctor as examinee, who delight in "catching him out" in trivial technical errors, and especially in recovering from their disorders after having disregarded his advice. As Sir Henry Brackenbury says, this competitive spirit is probably born of fear, and it is hard to believe that anything is to be gained by preserving an atmosphere of mystery with such patients since, by so doing, the element of fear may be increased. The genuine unstilted friendship subsisting between so many general practitioners and their patients is surely the greatest incentive to mutual confidence and coöperation. The intelligent patient no longer expects his doctor to be mysterious and infallible. What he does expect (and usually gets) is a reasonable amount of skill and care. Dr. Robert Hutchison said recently that the individual doctor is probably better liked than the profession as a whole, and it is, perhaps, fitting that it should be so.

A SPECIAL lecture by Dr. W. B. Coley, of New York, on the treatment of inoperable malignant tumours with the toxins of erysipelas and *Bacillus prodigiosus*, based on a study of end-results from 1893 to 1934, will be delivered at the Royal College of Surgeons of England on Thursday, Oct. 10th, at 5.30 P.M.

BIRMINGHAM CHILDREN'S HOSPITAL.—An innovation among children's hospitals in this country is the erection at this hospital of a special block of buildings for infants under two. The reason given for the separation of sick babies from older children is that infants ar particularly liable to contract catarrhal infections. Tl aim at this hospital is to have a separate room for e infant, each nurse having charge of not more t two infants.

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[1] Diet and Physical Efficiency. By Howard W. Haggard, M.D., and Leon A. Greenberg, Ph.D., of the department of applied physiology in Yale University. London: Humphrey Milford, Oxford University Press. 1935. Pp. 180. 13s. 6d.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXX.—FOREIGN BODIES IN THE AIR AND UPPER FOOD PASSAGES

With few exceptions foreign bodies in the regions under consideration can be removed without injury to the patient and with the prospect of complete cure. The conditions vary greatly with the site of impaction and with the nature of the object.

In the Nose

Children may push pieces of pencil, beads, peas, or other small objects up the nose. There is unilateral obstruction of varying degree associated with rhinitis of increasing severity, leading to suppurative changes. Failure to remove the foreign body results eventually in one-sided blood-stained discharge, sometimes with fœtor, after a period of quiescence. Infection of sinuses may follow, together with signs and symptoms referred to the passage of infected material into the pharynx. Once the object becomes firmly impacted it is not likely to be extruded spontaneously; removal, usually under general anæsthesia, is essential, and will be followed by disappearance of symptoms and signs.

In the Paranasal Sinuses

The most common type of case for discussion under this heading is the result of an unavoidable accident—the slipping of the root of a tooth into the antrum during attempts at removal. Infection of the sinus follows, sometimes acute, but often of a less violent nature. The patient complains of nasal discharge, obstruction, and sometimes fœtor; the cause of the condition is revealed by physical and X ray examination. It is necessary to open the antrum by the canine fossa route, to remove the fragment of tooth, and to make a drainage opening through the inferior meatus of the nose. Treatment of this nature cures the condition, but failure to carry it out leads to all the disabilities and dangers of maxillary sinusitis.

In certain cases pieces of shrapnel, bullets, or the broken end of a cannula are found in the antrum and may cause suppuration. It is, however, possible for an uninfected object to remain quietly in the cavity without causing symptoms.

In the Nasopharynx

The blade of an adenoid curette may break off in the nasopharynx and become impacted there. It will cause inflammatory changes, with subsequent suppuration if not removed, a procedure not fraught with any great difficulty. Vomited material may be projected into the nasopharynx, but is usually ejected spontaneously.

In the Pharynx

Smooth objects do not lodge in this region unless they are of great size, as, for instance, large pieces of meat or fruit. The prognosis in such an instance is extremely bad, as the aperture of the larynx may become obstructed, and attempts at removal with a finger may only serve to push the obstructing object further down. If asphyxia is impending immediate laryngotomy is required to save life, followed by removal of the foreign body under vision.

Small objects of a sharp nature such as bristles, [illegible] or meat bones, pins or needles, may become [illegible]k in a tonsil, in the vallecula, or in the pyriform fossa. In the two first-named positions considerable discomfort is produced, with pain on swallowing; there is seldom danger to life or even severe illness. In the pyriform fossa the position is more serious as perforation of the pharyngeal wall may result. Such an accident is of great danger, as it leads to surgical emphysema and cellulitis, possibly tracking down into the mediastinum, and associated in bad cases with erosion of blood-vessels and even of the common carotid artery.

Irritation of the outer aspect of the larynx leads rapidly to marked swelling of the lax connective tissue of the aryteno-epiglottic folds. Stridor and slight dyspnœa may result, but seldom to a degree sufficient to call for tracheotomy. Suppuration at the site of impaction may, however, lead to the inspiration of infected material, causing septic bronchitis or bronchopneumonia.

In every case the foreign body must be removed with forceps under vision afforded by the use of a tongue depressor, or a laryngeal mirror, or else through a direct laryngoscope. Unless perforation has already occurred all symptoms and signs should disappear rapidly. If the pharyngeal wall is perforated, with resulting external signs, incision through the skin is required. If carried out early and thoroughly this operation should save the patient's life, except in the rare cases where a large artery has been eroded. The seriousness of the complications make it imperative to take careful notice of the patient's complaints and to act with the requisite expedition and thoroughness.

Sometimes a neurosis is set up by a foreign body which has passed on, after temporary impaction, the patient experiencing sensations of pricking and other irritation. If no bone or bristle is found reassurance and some local sedative treatment should lead to disappearance of symptoms.

In the Larynx

Reference has been made to the danger of a large bolus of food lying over the laryngeal aperture or pushed in by blind attempts at extraction. Removal must be rapid to save life, and generally a more useful procedure is the opening of the trachea or larynx. Small objects are seldom arrested in this region. Those which pass through the pharynx usually pass on into the mouth of the œsophagus; if directed into the airway they are likely to be drawn into the trachea and bronchi. Pins and needles, however, may stick in the larynx; they cause temporary cough, followed by a quiescent period, until inflammatory changes cause laryngitis, possibly of a suppurative nature, with perichondritis. Removal through a direct laryngoscope is required, and will be followed by disappearance of symptoms. The proceeding must be carried out with the patient in the Trendelenburg position, as otherwise the dislodged object may pass into the bronchial tree, when the prognosis may become serious.

In the Trachea

Anything which slips through the glottis tends to drop into one or other bronchus and not to stay in the trachea, owing to the considerable size of the latter. Light vegetable objects, such as pieces of nut, may however remain in this part of the airway and will then be blown up and down during inspiration. They do not cause asphyxia by virtue of their size, but give rise to dangerous symptoms because of their irritating nature. Acute tracheitis is produced with abundant secretion and high temperature. Œdema of the glottis may be pronounced and will call for tracheotomy unless bronchoscopic removal is carried out early. Even then dyspnœa may still be distressing, and should be relieved by opening the trachea. The prognosis is grave if this is not done, but is favourable if the correct treatment is followed. The main danger after relief of obstruction at the glottis is from broncho-pneumonia.

In the Bronchi

The prognosis depends on correct diagnosis of the condition and on the possibility of surgical removal. The false hope that the intruding body will be coughed up must not be allowed to prevent bronchoscopic examination, as delay will prejudice the prospects of cure.

There is a vast difference in the prognosis between foreign bodies of vegetable and those of non-vegetable nature. With the former symptoms and signs are early, violent and extremely dangerous, and are caused by the chemical irritation of the intruding substance. As mentioned above, acute tracheo-bronchitis appears, often with œdema of the glottis. The condition is one of urgency and calls for immediate bronchoscopy and removal of the piece of nut, orange or melon pip, or fragment of vegetable. If this is done and if tracheotomy is performed at once should laryngeal obstruction become severe, the prognosis is excellent; if correct treatment is not carried out, owing to lack of skill or opportunity, death is to be expected.

Non-vegetable objects, on the other hand, may lie dormant for months or even years before causing marked symptoms and signs. There is no serious dyspnœa, as the unobstructed lung suffices for respiration. Cough is of temporary duration and only reappears if the object changes its position or if irritation of the bronchial walls leads to inflammatory changes; mucosal swelling and granulations then appear, causing obstruction to the entrance of air and escape of secretions.

Inflammatory changes naturally occur earlier if the foreign body is already infected, as in the case of a tooth, than if it is, for instance, a bead and relatively clean. The patient harbouring an infected foreign body suffers from purulent sputum, sometimes with hæmoptysis, associated with recurrent pyrexial attacks. Lung abscess may ensue and the prolonged suppuration may lead to severe ill-health, with wasting and clubbing of the fingers. Pulmonary tuberculosis must be excluded and a bronchoscopic search then made for the cause of the condition, even in the absence of definite X ray evidence of a foreign body. Pieces of bone or teeth may not show up in radiograms owing to the opacity of collapsed lung.

Except in rare cases, where lung changes are far advanced, removal of the foreign body cures the patient, provided that in the presence of extensive suppuration subsequent bronchoscopic aspiration is carried out. In very advanced cases lobectomy is indicated.

A fine object like a pin may travel down into a distant bronchus and lie dormant for years before causing symptoms. Eventually inflammatory changes occur, and here again the prognosis depends on the question of removal. This requires the use of a double plane fluoroscope. Removal under X ray guidance has considerable dangers unless great care is employed.

In all these cases there is always ample time for all necessary preliminary investigations, including careful radiographic examination. The patient must be transferred to a suitable centre where adequate equipment is available, in the hands of experienced operators. There is no excuse for undue haste or for attempts at removal by those without the requisite skill.

In the Œsophagus

The usual site of impaction is at the crico-pharyngeal fold or, in very young children, rather lower down, at the level of the thoracic inlet. Coins, bones, ordinary pins or safety-pins, and dentures are met with. Smooth objects such as coins are not in themselves likely to lead to a fatal result, although they cause great discomfort and ill-health by reason of partial obstruction to the entrance of food and saliva. A halfpenny may be found, after some three months' sojourn, embedded in granulation tissue, causing dysphagia of considerable but not extreme degree. Careful removal through an œsophageal speculum or œsophagoscope should be followed by a rapid cure; cicatricial stenosis is not likely to follow. It is hasty and ill-considered attempts at blind removal with forceps guided by a finger, or by means of a coin catcher, that lead to danger from injury to the œsophageal walls. An object such as a collar stud, even though smooth, may cause great danger by pressing on the soft posterior wall of the trachea. Early removal gives a good prognosis and tracheotomy should not be necessary. Sharp objects such as bones should be removed as soon as possible, under direct vision, owing to the danger of perforation; contraction of the crico-pharyngeal sphincter may squeeze the object through the hypopharyngeal or œsophageal walls. Early and effective treatment gives an excellent prognosis. Here again attempts at removal by any blind method, as with a probang, are dangerous and unjustifiable. If perforation occurs the outlook is serious, but early external incision and drainage, together with removal of the foreign body, should hold out a good prospect of cure. Laceration of the walls during the removal of a denture fitted with sharp hooks may lead to danger; avoidance of this accident depends on the skill and care of the operator and the suitability of his instruments. Safety is attained, in dealing with cases of a penetrating nature, by removal under general anæsthesia in order to obtain some degree of relaxation of the crico-pharyngeal sphincter.

Most objects which pass the crico-pharyngeal fold and thoracic inlet travel through the œsophagus into the stomach. A bone may, however, pass down the œsophagus and perforate the thoracic segment, with para-œsophageal abscess as a result; the outlook is very bad, but the most hopeful prospect is given by opening the abscess through an œsophagoscope rather than by the external thoracic route.

Summary

No branch of surgery gives such gratifying results as that of foreign bodies. Lack of correct treatment may be followed by prolonged ill-health or death, while removal by suitable methods leads to complete cure. In the majority of cases the prognosis depends considerably on the provision of suitable equipment, used with adequate skill. Hasty and ill-advised attempts at removal afford as great a source of danger as is provided by the foreign body itself.

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SPECIAL ARTICLES

PLASTER TECHNIQUE IN THE MODERN TREATMENT OF FRACTURES

By K. H. Pridie, M.B. Lond., F.R.C.S. Eng.

SURGICAL REGISTRAR TO THE FRACTURE CLINIC AND ORTHOPÆDIC DEPARTMENT OF THE BRISTOL ROYAL INFIRMARY

(Concluded from p. 685)

The Standard Colles's Plaster

After reduction of the fracture the arm is held by the assistant, who applies countertraction on it, with the elbow bent, whilst the surgeon applies traction on the thumb, so that the hand assumes the position of ulnar deviation, the forearm being fully pronated. A strip of adhesive felt, $\frac{3}{16}$ in. thick by $1\frac{1}{2}$ in. wide, is placed round the arm below the elbow.

THE CAST

1. A dorsal slab is made from a 6 in. by 3 yd. plaster bandage (4 in. for a child). This is made six inches longer than the measurement of the arm from the bend of the elbow to the metacarpal heads (Fig. 13). This slab is laced on the back of the forearm, the extra length being oubled back at the hand to strengthen the wrist portion f the cast (Fig. 14).

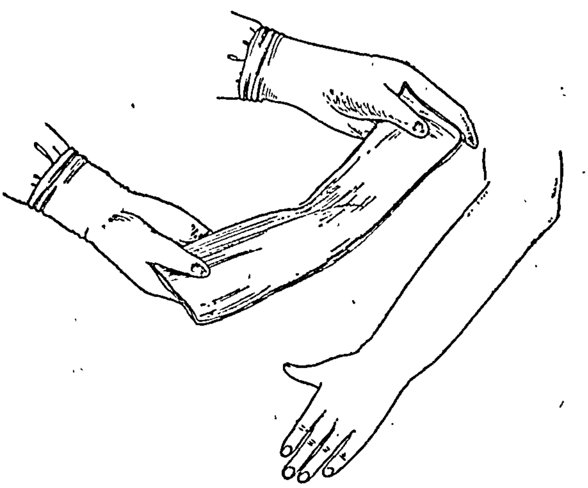


FIG. 13.—Plaster slab applied to the dorsum of the forearm.

The plaster should extend one inch from the olecranon process on the extensor surface of the arm. It should be folded back obliquely (so that it does not press in the antecubital fossa when the arm is flexed) to half an inch behind the metacarpal heads, and the excess turned back over the back of the wrist.

2. The slab is well rubbed on to the hand to exclude air bubbles, and it is fixed to the forearm with a wet gauze bandage, applied from the creases of the wrist to the elbow (Fig. 16).

3. A malleable copper wire band (gauge 12 adults, 16 children) is then made as shown in Fig. 15. This passes round the hand and secures it to the dorsal slab as shown in Figs. 17 and 18.

If the fracture has needed reduction, or if there is much swelling, the plaster should not be completed until the next day, and the patient should be given instructions o keep the hand elevated and not to hang it by his side. nstructions should be given to keep the arm elevated ove the rest of the body at night by laying a pillow the chest and placing the arm thereon. In the day hand should hold on to the coat lapel of the opposite

4. The next day, should the reduction prove to be satisfactory from a second X ray, and should the swelling have subsided, the plaster is completed by the application of a 4 in. by 3 yd. bandage, applied in a circular manner, over the original wet gauze bandage, from the elbow to the creases of the wrist.

This standard Colles's plaster is used in:

1. Colles's fracture after reduction. The cast is worn for 4 weeks.
2. Separated lower radial epiphyses in children. The cast is worn for 3 weeks.
3. Greenstick fractures of the lower end of the radius and ulna in children. The cast is worn for 3–4 weeks.
4. Fractures of the scaphoid. These should be put up in radial deviation and slight dorsiflexion, and kept up until X ray shows union, in 3 months or more.
5. Metacarpal fractures.
6. Difficult finger fractures. In (5) and (6) the plasters are slightly modified.

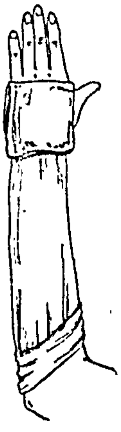


FIG. 14.

Excess length is turned back

Lower Third of Radius and Ulna

These fractures after reduction cannot be adequately fixed by the short forearm cast just described, because pronation and supination must be prevented. The occurrence of *ununited* fractures of the lower end of the ulna is due to the fact that the movement of pronation and supination is commenced too early; the rotation occurs about the fracture site in the ulna—thus preventing union.

U-shaped plaster is used for these casts, which are best fixed in the midway position between supination and pronation.

A 30 in. long slab is made from two 4 in. by 3 yd. plaster bandages. This is placed in a U-shaped manner from the metacarpal heads, along the extensor surface of the forearm, round the elbow, and along the flexor surface of the forearm to the crease of the wrist.

This is fastened to the arm by a wet gauze bandage.

A copper wire band is applied as before to hold the hand.

Full Arm Plaster

A band of adhesive felt is placed round the arm just below the axilla.

1. A plaster slab, 24 inches long, is made from tw 6 in. by 3 yd. plaster bandages (two 4 in. bandages for children). This is placed on the extensor surface of the arm and forearm, which is held in a flexed position just above a right angle and in mid position between pronation and supination (Fig. 19).

2. This is fixed with a wet gauze bandage.

3. A 24 in. slab made from one 4 in. by 3 y bandage is placed to encircle the elbow as shown i Fig. 20.

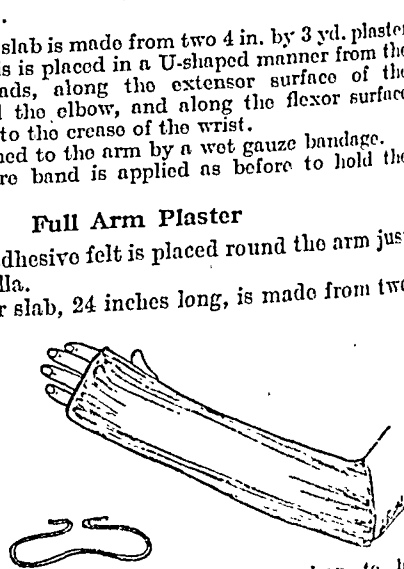


FIG. 15.—Shaped copper wire loop to h attached to plaster slab.

4. A 24 in. slab made from one 4 in. by 3 yd. bandage is placed round the top of the slab.

5. A copper wire is placed round the hand as previously described (Fig. 21).

The full arm plaster is used for (1) fractures of the upper third of the radius and ulna; (2) fractured head of radius, when the segment fractured is not displaced; (3) supracondylar fractures, after swelling has subsided.

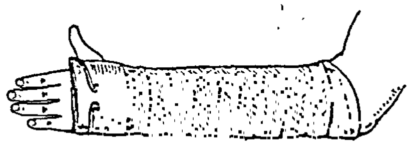


FIG. 16.

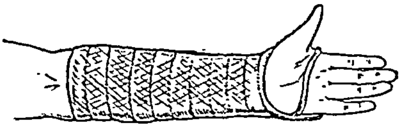


FIG. 17.

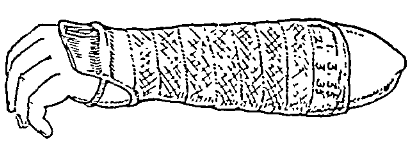


FIG. 18.

Standard Colles's plaster. A wet gauze bandage over the plaster slab secures the wire loop.

Fractures of the Metacarpals

If there is no displacement the standard Colles's cast, extending to the metacarpal heads, will adequately immobilise the fragments and allow the fingers to be used without pain. If, however, there is displacement, so that the bones are overlapping and the knuckle falls back, an extension apparatus must be fixed to the standard Colles's cast, which is the basis of all finger-fracture casts. A U-shaped wire is joined to the dorsal aspect of the dry cast, so that the limbs of the wire extension run parallel to the finger whose metacarpal has been fractured. The end of this U-shaped wire should project 1½ inches beyond the tip of the finger.

A Kirschner wire is then introduced through the pulp of the finger and an extension is made from this to the end of the wire splint.

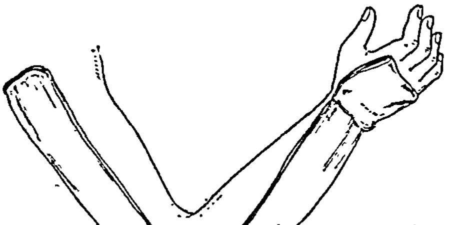


FIG. 19.

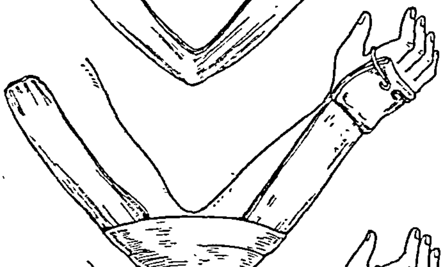


FIG. 20.

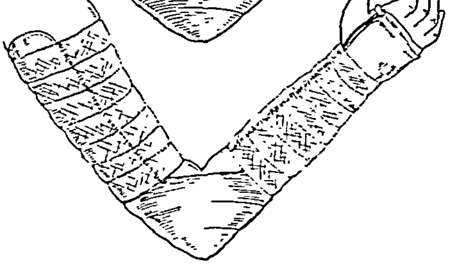


FIG. 21.

Full arm cast, showing wire round hand, and reinforcement of elbow. There are no circular turns of plaster, only of gauze, until swelling has subsided.

Fractures of the Phalanges

The most troublesome of the phalangeal fractures are those through the proximal phalanx. Here the distal fragment tends to be displaced backwards, and these fractures must be treated in flexion. If there is no displacement, the best method of treatment is to place the finger in flexion round a 1½ in. gauze bandage and strap the finger in this position with a strip of elastoplast. The finger is kept in this position for 10–14 days, according to the severity of the fracture.

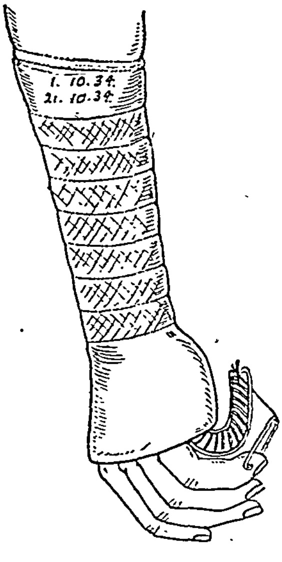


FIG. 22.—Modified Colles's plaster for severe fracture of proximal phalanx with backward displacement.

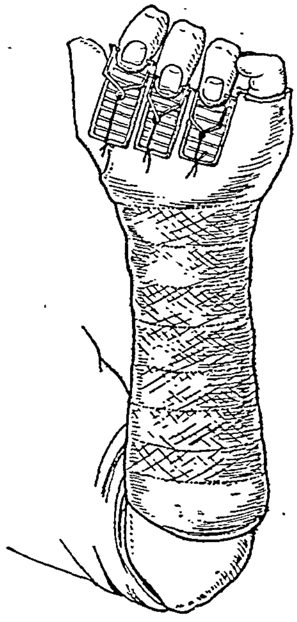


FIG. 23.—Traction applied for multiple phalangeal fracture with displacement.

If there is gross angulation or overlap, traction must be applied to the finger in the flexed position.

The standard Colles's back slab is first applied to the dorsum of the hand and forearm, and fixed with a wet gauze bandage. A ventral slab is then applied extending from just behind the metacarpo-phalangeal joint on the palm to the bend of the elbow.

A Cramer wire splint, ¾ in. wide, which has been bent into a wide U-shape, is padded with adhesive felt on its convex surface, and one end is incorporated in the ventral slab and so fixed that the distal limb of the "U" extends at least 1½ in. beyond the tip of the finger, as shown in Figs. 22, 24 and 25.

A Kirschner wire is then introduced through the pulp of the finger, and extension applied from this to the extremity of the Cramer splint.

Where many phalanges are fractured the splint modified as shown in Figs. 23, 24, and 25. The extension is applied for three weeks to a month, after which active movements are commenced. No physiotherapy should be used until the fracture has united. The same method may be used for the intermediate phalanx. Fractures of the distal phalanx need no special splinting.

For the treatment of torn extensor tendons to terminal phalanges a small slab is made 3 by 2 in. and this is wrapped round the finger, which is kept with the terminal joint hyperextended and the first *two joints flexed. This should be left on for at least* six weeks.

FIG. 24.

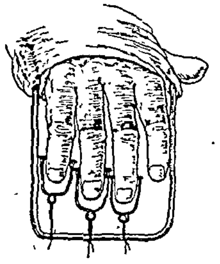
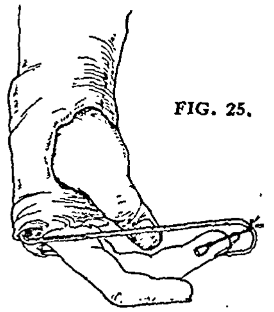


FIG. 25.



Modification used for compound phalangeal fractures needing traction.

The Skin-Tight Back Splint

This splint is used to immobilise the knee-joint:—

(*a*) In cases of partial fractures of the patella and stellate fractures without displacement (4 weeks).

(*b*) Fractures of the patella after operation enabling the patient to walk with safety after 4 days (4 weeks).

(*c*) Dislocated internal semilunar cartilages after reposition (2 weeks), torn internal or external lateral ligaments or cruciate ligaments (6 weeks).

(*d*) After immobilisation of a tuberculous knee, when the condition is considered quiescent and the patient may commence walking with a guarding plaster (4 weeks or longer).

The method of application is as follows:—

A strip of $\frac{3}{16}$ in. thick adhesive felt, $1\frac{1}{2}$ in. wide, and varying in length according to the circumference of the limb, is placed round the leg four fingers-breadth above the ankle-joint. A second strip is placed obliquely just below the groin.

Four plaster slabs, 33 to 36 in. long, made from two 6 in. by 3 yd. bandages, are placed on the limb—

one on the external aspect
one on the internal aspect
one on the posterior aspect.

The fourth is placed round the top in a circular manner, the remainder is cut off and placed round the bottom. These circular rings prevent the plaster spreading.

The plaster can be completed with a 3 in. wet gauze bandage or, if thought necessary, by two 4 in. by 3 yd. plaster bandages.

Skin-Tight Plaster after Subtrochanteric Osteotomy

The most important part of this operation is the plaster fixation afterwards. This can be simplified if before the operation a standard light below-knee cast is applied and then continued to mid-thigh. A body cast is made with the patient standing. After the operation the two casts are joined together. This only takes a few minutes, and it is easy to determine the right angle of correction.

When the mid-thigh cast has been applied the patient is placed in a standing position on the floor; the pelvis is then made level by adjusting the affected leg. Adhesive felt is applied to the bony prominences in the following manner:—

1. A strip 2 in. wide is applied over the posterior spinous process from the top of the sacrum to the upper limit of the plaster.

2. A triangular piece covers the sacrum from the tip of the coccyx to the posterior superior iliac spines. Two pieces $1\frac{1}{2}$ in. in width are applied to the iliac crests. One piece, 2 by 3 in. (approximate), is applied to the pubic region.

Two 6 in. by 3 yd. plaster bandages are applied over the full extent of the cast in a circular manner, each turn having a pleat taken in it to make it fit the body accurately without tight pulling. Great care is taken to rub the layers as they are being applied. The remainder of the cast is of slabs made from 6 in. by 3 yd.

The first slab is made 36 in. long from two 6 in. by 3 yd. bandages. This is cut in half and one half applied over the iliac crest from the tip of the sacrum posteriorly, over the crest of the ilium, to the pubis in front. The other half is applied to the opposite side in a similar manner.

Two lateral slabs are made from two 6 in. by 3 yd. bandages and placed laterally. One slab is applied posteriorly over the spinous processes from top to bottom. The top of the plaster is finished by one slab. The whole cast is made smooth by two 6 in. by 3 yd. bandages applied in a circular manner.

The edges are then everted and polished with french chalk; when the cast is dry the front is cut out.

After the operation of subtrochanteric osteotomy dressings are applied, and then several turns of wood-wool bandage. The two casts are then joined together by four plaster slabs, 2 ft. long, each made from one 6 in. by 3 yd. bandage. Two bandages, 6 in. wide, applied spirally complete the cast.

This method reduces the time of the operation enormously. It is much easier to judge the required correction and angulation. The cast can be fitted so well that the patient is able to start walking after 3 to 4 weeks —often indeed after 1 week.

THE WALKING SPICA PLASTER

If the leg is placed in the neutral position—i.e., 15° flexion and at right angles to the pelvis—a Bristol iron is applied to the bottom of the plaster as in the standard below-knee cast. If, however, there is much abduction it is advisable to apply a third leg to the cast, made of wood and iron (Fig. 26).

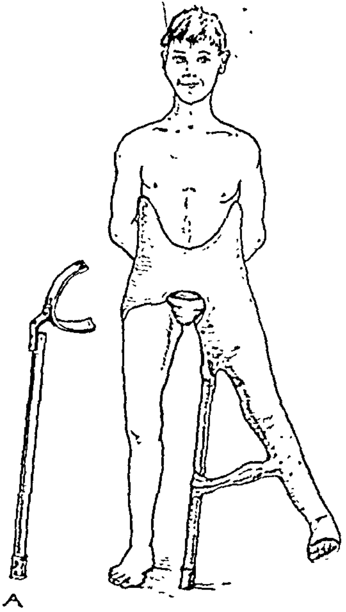


FIG. 26.—Abduction walking plaster.

Directions to Patients

A printed instruction sheet should be given to each patient treated by a plaster cast. The patient should be made to read it and sign the bottom of the card. This card is most important, as it will relieve the surgeon of responsibility where the patient fails to attend or does not carry out the instructions.

INSTRUCTIONS TO OUT-PATIENTS WITH FRACTURES (BROKEN BONES), INJURIES, OR DISEASES TREATED IN A PLASTER-OF-PARIS CAST

Name of patient.......................................

1. For the next........hours you must lie down.

2. During that time, in the case of a fracture of any bone in the upper limbs, have the hand raised so that it is the most elevated part of the body.

In the case of the lower limbs (for example, a broken ankle) raise the foot of the bed and place the plaster cast on a pillow.

You should report to the casualty department if you notice any tightness of the plaster cast, indications of which will be noticed in the fingers and toes as follows:—

(*a*) Marked swelling.

(*b*) Marked blueness.

(*c*) A tight severe pain which is not eased by elevating the limb.

(*d*) Inability to move the fingers or toes. (You should continually move them even while resting.)

(*e*) Numbness or loss of sensation.

Report daily until further notice.

.....................Surgeon-in-Charge.

Patients should be instructed to use the injured limb within the limits of pain, and it should be stressed to them that the more they use the limb the better will be the final result. The patients should not be allowed to use a sling.

SPECIAL INSTRUCTIONS TO FRACTURE CASES TREATED IN PLASTER

A. *Arm Cases*

1. When walking about and not actually using the injured arm you must keep the arm across the chest and grip the lapel of the coat on the opposite side, as long as there is any tendency to swelling. If the injury is below the elbow the arm should be put through the sleeve in about a week's time and the hand used normally.

2. Use the hand and fingers as much as possible for writing, eating, knitting, ordinary household duties, and lifting light objects; this acts as massage to the injured part. If you cannot use the hand there is something wrong and you must see your doctor again.

3. The fingers, elbow, and shoulder should be put through their full range of movement at least 20 times each day. All joints not immobilised by the plaster must be actively exercised.

4. The wire across the palm must be kept well pressed in the middle of the palm. It should not press on the skin at the sides or impede the grip of the hand.

B. *Leg Cases*

1. For the first week following the application of a plaster cast the leg when at rest should be elevated above the rest of the body. Pain due to swelling can be relieved by raising the leg on a box, on which is a pillow. It is advisable for the first week to keep the leg thus elevated in bed.

2. When not actually walking the leg should be raised on a chair. The patient should not stand about on the leg but sit down with it elevated.

After the first week or two the patient can generally disregard these instructions.

3. Patients should walk as much as possible. At first two sticks should be used, then one, which should be held in the opposite hand to the injured limb.

4. When the rubber is worn out on the walking iron it must be replaced.

After-Treatment

Arm.—After an arm cast has been removed the movements of the various joints should be tested. Half range of movements should be obtained almost immediately, and full range after 14 days in many cases. The patient should be instructed to go home and use the limb as much as possible. Until the dry skin has been removed the affected part should be soaked in hot water, and afterwards rubbed with olive oil, twice a day. The case should be seen again after 14 days; in cases where it is considered necessary some form of physiotherapy must be ordered. Approximately 5 per cent. of cases need this.

Leg.—After a leg cast has been removed the limb should be washed with some abrasive soap. After this the movements should be tested. The mid-tarsal joints should be gently manipulated with the hand, as adhesions may have formed in these joints following the longer periods of immobilisation. Some form of supporting bandage must be applied: (*a*) viscopaste where there is no swelling; (*b*) elastoplast if there is swelling. The bandage must be applied to pronate the fore-foot and invert the hind-foot.

(Viscopaste—zinc and gelatin—may, if desired, be hardened with 6 per cent. formalin in spirit.)

PARIS

(FROM OUR OWN CORRESPONDENT)

TUBERCULIN TESTING OF THE FRENCH ARMY

RECENT advances in the study of tuberculosis have done so much to upset certain conceptions with regard to the Pirquet test that it has become necessary to reconsider the whole problem. The director-general of the French Army Medical Service issued in January last a memorandum on tuberculin skin tests in the army. The persons to be tested first are orderlies exposed in the course of their professional duties to infection with tuberculosis; but it may well be that the investigations will be extended to other units. The idea of a Pirquet comb-out of army units in France is not new; in 1934 Debenedetti and Foret carried out Pirquet tests on a regiment stationed in St. Germain-en-Laye, and they found 42 per cent. to be Pirquet-negative. In the *Archives de Médecine et de Pharmacie Militaires* for September, 1935, Prof. M. L. E. Pilod, of the military Val-de-Grâce Hospital, devotes a long article to this subject, discussing the administrative measures that may be desirable as a sequel to the findings he anticipates. Impressed by Heimbeck's studies of Pirquet-positive and Pirquet-negative nurses in Oslo, Prof. Pilod suggests that the orderly found to be Pirquet-negative should without more ado be removed from service on cases of tuberculosis likely to cause a massive infection. While this precaution might well be put into force immediately, there are other possible measures whose application must wait. The most susceptible recruits—i.e., the Pirquet-negative reactors—might perhaps be given special quarters or grouped in special units so that they are exposed as little as possible to undetected infectious cases of tuberculosis. With regard to the vaccination of suc negative reactors with B C G, Prof. Pilod notes th the experience of Brazzaville has shown that e adolescents and adults may benefit from the administration of B C G by the mouth. If the subcutaneous route could be avoided without loss of efficacy, and B C G be given as it is to new-born babies, by the mouth, such preventive treatment of Pirquet-negative recruits might well prove a satisfactory solution of one aspect of the problem.

PIERRE MÉNÉTRIER

Prof. Ménétrier, who died recently following a motor accident, was president of the French Academy of Medicine in 1930. Born in 1859, he first attracted attention in the medical world by his study in 1887 of influenza and pneumonia. Thereafter he published a long series of studies of pathological and bacteriological problems, notably on experimental cancer in mice and on cancer produced by X rays. Ménétrier had to face considerable opposition to his conception of cancer, not as a morbid entity, but as the end of a series of "preparatory pathological states." He was a believer in inflammation as a precursor of cancer, and he looked upon gastritis and ulceration of the stomach as forerunners of malignant disease. It was in his capacity of professor of the history of medicine that Ménétrier had a great following, his wonderful memory and scholarly grasp of his subject being keenly appreciated by his pupils.

BUCHAREST

(FROM OUR OWN CORRESPONDENT)

COMPULSORY IMMUNISATION AGAINST DIPHTHERIA

THE Minister of Public Health has made immunisation against diphtheria compulsory for every child under 10 years of age. The immunisation is carried out with the Ramon antitoxin prepared in a Rumanian serological institute owned by Prof. I. Cantacuzino. The inoculations are performed without charge for professional services or material by official physicians, medical officers of health, district physicians, hospital physicians, or school doctors. Elaborate precautions are being taken to compile records of all children and to prevent evasion of the law. After inoculation the children are sent home from school for three days. After this year no children will be accepted in schools unless they produce evidence of having been inoculated against diphtheria, and no uninoculated children will be admitted to children's summer resorts or convalescent homes unless they are Schick-negative.

SPECIAL EXAMINATIONS FOR VILLAGE DOCTORS

The Minister of Public Sanitation issued an order which prescribes that all doctors who wish to obtain positions as medical officers of health in municipalities, rural districts, and villages must pass an examination in public health, forensic medicine, and toxicology. Examinations are to be held only in Bucharest. Candidates for these positions must also (1) possess a qualification obtained from a Rumanian university, and have been officially recognised as having a right to practise; (2) be a Rumanian citizen; (3) produce a certificate from the proper quarter that he has not been sentenced for any misdemeanour or criminal act; (4) has not had to resign from any official post by reason of any abuse or irregularity; (5) hold no other official or private post, and undertake not to accept one while he fills that for which he is a candidate; and (6) produce a certificate that he has fulfilled his military obligations.

A MEDICINAL SALT DISTRIBUTED BY TOBACCONISTS

In Rumania the sale of both tobacco and salt is the monopoly of the State. This circumstance explains, but does not excuse, the efforts made by the State Monopoly Office to push the sale of a proprietary drug described as natural sea-iodine-salt through its agents, the tobacconists' shops. The leaflets advertising the product state that Palladine, a sea-iodine-salt, when dissolved in baths is recommended for rheumatism, arthritis, anæmia, and general debility, that it allays nervous irritation, and cures uterine and ovarian disease. Emphasis is laid on the fact that the Ministry of Public Health has licensed the sale of this preparation in every tobacconist's shop. To this method of advertisement physicians and pharmacists are taking strong exception.

THE BUCHAREST ANTI-RABIES INSTITUTE

The Babes Anti-rabies Institute, so called after its founder, the late Prof. Victor Babes, has just published a report on the five years, 1929–33. The number of suspicious bites during this period was 36,421, distributed as follows:—

	In towns.	In villages.
Bites from dogs	15,491	10,378
,, ,, cats	1,451	406
,, ,, wolves	5	29
,, ,, horses	36	68
,, ,, swine	33	102
,, ,, *donkeys*	3	10

During the five years under review the number of persons bitten by rabid or suspected animals in Bucharest alone amounted to 9033; the yearly average number of those receiving antirabic treatment was 1806. This figure is alarmingly high in comparison with that of other European capitals—for example, Paris (531), Budapest (438), Vienna (194), Rome (154), Prague (143), or Berlin (36).

In 21 antirabic institutes in other countries 16,328 individuals were treated during 1931, while in the five institutes in Rumania 21,619 received treatment.

ANTISEMITISM AMONG STUDENTS

In his address at the opening of the session Prof. Dr. Gheorghiu, rector magnificus of the scientific faculty of Bucharest University, condemned the attitude during the past year of those medical students who instead of attending to their studies dabbled in nationalistic propaganda. Their antisemitic bias was not shared by their fellow countrymen as a whole. The Rumanian constitution granted citizenship to those of non-Rumanian origin who fulfilled certain conditions, and these citizens could not be prevented from enjoying their lawful right to study at the universities of the country.

"QUALIFIED MASTERS OF DENTISTRY"

The Minister of Public Welfare has issued an order which enacts that all dental technicians, who obtained their qualifications under the law issued in 19[illegible]4, are to use the title "qualified masters of dentistry" in place of "dental technician" on their name-plate and in advertisements, memorandums, and notes. The intention is to make clear that their occupation is regarded as a trade rather than as an art comparable with medicine.

The Goudard prize offered by the French Medical Academy has been won by Dr. Poenaru-Caplescu, professor of internal medicine at the University of Bucharest, for a thesis on the clinical study of appendicitis, the outcome of researches extending over more than twenty years.

THE MEDICAL REGISTER

UNTRACEABLE PRACTITIONERS, 1935

WE have been requested by the authorities of the General Medical Council to publish the following list of registered medical practitioners who had not, when the list was sent to press, replied to letters written to them on behalf of the Council under Section 14 of the Medical Act, 1858, in order to ascertain whether their addresses on the Medical Register are still correct. The date given after each name is the date of original registration; the qualification given is the principal qualification registered by the practitioner. The letters (E), (S), or (I) indicate whether the practitioner was originally registered in England, Scotland, or Ireland; and the expressions (Col) or (For) indicate that the practitioner is registered in the Colonial List or in the Foreign List in the Register. Any practitioner, wherever resident, who finds his or her name in the list should write without delay to the Registrar, General Medical Council, 44, Hallam-street, Portland-place, London, W.1, unless he or she was originally registered in Scotland. Practitioners originally registered in Scotland should write directly to the Registrar of the Branch Council for Scotland, 44, Queen-street, Edinburgh, 2. The name of every practitioner in the list from whom a further communication is not received at a very early date will be omitted from the next issue of the Register in accordance with the provisions of Section 14 of the Act of 1858.

Aikman, Cedric W., M.B., 1914(S).
Ainsworth, Douglas R., M.R.C.S., 1922(E).
Airey, Geoffrey G., M.R.C.S., 1933(E).
Alexander, Henry S. A., M.B., 1914(S).
Allan, Hamish, M.R.C.S., 1932(E).
Allen, Vincent E. N., M.R.C.S., 1928(E).
Anderson, James C., M.B., 1915(S).
Anderson, James McL., M.R.C.S., 1928(E).
Atkinson, Thomas R., M.D., 1881(E).

Barrett, Ernest, M.R.C.S., 1886(E).
Baxter, George S. M., L.R.C.P., 1882(I).
Beggs, George E., L.R.C.P. & S., 1911(I).
Bennett, Thomas, M.B., 1903(S).
Bentlif, Philip B., M.R.C.S., 1883(E).
Bhuttacharji, Jitendra C., L.R.C.P. & S., 1895(S).
Birch, Philip, M.R.C.S., 1874(E).
Birrell, David A., L.R.C.P. & S., 1893(S).
Blake-Campbell, John F., L.R.C.S., 1884(I).
Brogden, George A., M.D., 1899(S).
Brown, Doris, M.B., 1921(E).
Browne, Frederick G. F., M.B., 1912(E).
Bryan, Cyril P., M.B., 1921(I).
Buck, Mary, M.R.C.S., 1923(E).
Burke, Hubert W., L.R.C.P., 1883(E).
Burke, Ulick J., L.R.C.P. & S., 1897(I).

Cambridge, William R., M.R.C.S., 1933(E).
Campbell, Angus, M.B., 1893(S).
Carter, Henry F. (formerly Cohen, Highman F.), M.B., 1932(E).
Clements, John H., L.S.A., 1902(E).
Cooper, Edward H., M.R.C.S., 1896(E).
Corke, Cecil A., L.R.C.P., 1878(E).
Coventry (Mrs.), Gladys A., M.B., 1928(E).
Curaba, Francesco, M.D., 1930(For).
Cussen, Gerald E., M.B., 1920(Col).

Davidson, Georgina E., M.B., 1915(S).
Denton-Fethers, Percy, L.R.C.P. & S., 1893(E).
De Silva, Kariyawasan W. T. J., L.M.S., 1919(Col).
Devonald, Alfred E. L., L.M.S.S.A., 1911(E).
Dickson, James A., M.C.P. & S., 1930 (Col).
Dornford, Charles T., M.R.C.S., 1885(E).
Duguid, Nigel, M.B., 1924(S).
Dunlop, John, M.B., 1906(I).
Dunlop, Robert H., M.B., 1924(S).
Dyson, Percy A. S., M.R.C.S., 1909(E).

Earle, Percy M., L.R.C.P., 1886(E).
Eccles, John Y., M.R.C.S., 1925(E).
Edwards, Howard S., M.R.C.S., 1926(E).

Findlay, William D., M.B., 1895(S).
Forrest, John G. S., M.R.C.S., 1877(E).
Forsyth (Mrs.), Edith M., M.B., 1927(E).
Freeman, William J., M.B., 1929(Col).
Fyfe, Andrew A., M.R.C.S., 1912(E).

Games, John H. P., M.R.C.S., 1928(E).
Gibbon, Thomas H., *O.B.E.*, M.D., 1903(I).
Gollerkeri, Ganesh V., M.B., 1922(Col).
Good, John R., M.D., 19[illegible](Col).
Gunn, Michael B., L.R.C.P. & S., 1917(I).

Hankin, Stanley, M.B., 1932(S).
Harrison, Tilson L., M.C.P. & S., 1923 (Col).
Hart, Herbert F., M.B., 1898(E).
Hartzhorne, Bernard F., M.R.C.S., 1884(E).
Henstock, John L., M.R.C.S., 1890(E).
Hepburn, Aglionby D., M.B., 1921(E).
Holmes, Joseph, L.R.C.P., 1882(E).
Horsley, Lancelot, M.R.C.S., 1915(E).
House, Denis R., M.R.C.S., 1928(E).

Jefferson, Robert P., M.R.C.S., 1884(E).
Jenner-Clarke, Reginald, M.R.C.S., 1919(E).
Johnstone, Robert, M.B., 1925(S).
Jones, Arthur R., M.R.C.S., 1897(E).
Jones, David W., M.R.C.S., 1914(E).

Knowles, Beatrice, M.D., 1897(E).

Lansdown, Alice E., M.R.C.S., 1922(E).
Lee, Alfred W. H., L.R.C.P., 1882(E).
Lee, Daniel, M.S., 1885(E).
Leigh, Annie T., M.B., 1925(E).
Lewis, John G., L.M.S.S.A., 1915(E).
Lewis, William E. V., M.R.C.S., 1901(E).
Lindsay, Douglas M., M.D., 1919(S).

Macarthy, James J., M.D., 1859(I).
McCausland, Samuel R., L.R.C.P. & S., 1901(I).
Macfarlane, James, M.B., 1921(S).
Macgregor, Duncan M., L.R.C.P. & S., 1899(S).
McGuckin, John B., M.B., 1925(I).
Mackay, Margaret S., M.B., 1925(S).
Malcolm, Robert J. W., M.B., 1931(Col).
Martin, Henry O., M.B., 1926(E).
Martin, James H., *D.S.O.*, M.R.C.S., 1864(E).
Martin, John, L.R.C.P. & S., 1914(S).
Mazzarella, Gerardo, M.D., 1930(For)
Mehta, Nanalal M., M.R.C.S., 1912(E).
Moore, Alexander G. H., M.R.C.S., 1913(E).
Moore, George L., L.R.C.P., 1885(E).
Moorhead, William St.L., L.R.C.P. & S., 1908(I).
Mortimer, Hector, F.R.C.S., 1914(S).
Mortimer, Leonard W., M.R.C.S., 1914(E)
Muirhead, Edith A., M.R.C.S., 1932(E).

Nasmyth, Roy D., M.C.P. & S., 1920(Col).

O'Donnell, Patrick J., M.D., 1921(I).
Orlek, Aaron, M.R.C.S., 1934(E).
Owens, Robert D., M.B., 1925(E).

Peake, Dorothy E., M.R.C.S., 1924(E).
Penny, Jeremiah, M.R.C.S., 1887(E).
Perkins, Herbert E., L.R.C.P., 1908(E)
Plunkett, Bernard, L.R.C.P. & S., 1925(I).
Powell, Walter A., M.R.C.S., 1892(E).

Rice, Charles E., L.M.S.S.A., 1918(E).
Robinson, John B., M.R.C.S., 1928(E).
Roche, James L., L.R.C.P. & S., 1933(S).
Row, Kalyanpurker R., M.B., 1928(Col).

Saayman, Donald H., M.B., 1922(I).
Sadleir, Richard E., L.R.C.P. & S., 1923(I).
Sahai, Bishambhar, M.R.C.S., 1916(E).
St. John, Alfred H. V., L.R.C.P., 1908(E).
St. John, Frederic A., F.R.C.S., 1919(E).
Salama, Anis, M.R.C.S., 1923(E).
Sampey, Alexander W., M.R.C.S., 1933(E).
Sand, Charles, M.B., 1914(S).
Sanders, Gerald G., M.B., 1921(S).
Sargent, Henry B., M.B., 1917(S).
Schenck, Edward, M.R.C.S., 1907(E).
Scully, Reginald W., L.R.C.P. & S., 1895(I).
Scutt, Tom, M.R.C.S., 1884(E).
Seccombe, George S., M.R.C.S., 1874(E).
Sethna, Dosabhoy C., M.B., 1898(E).
Shaw, Freni M., M.R.C.S., 1933(E).
Sheedy, John, M.D., 1884(I).
Sheehan, William B. J., M.B., 1928(Col).
Sheehy, Charles, M.B., 1926(I).
Sheridan, John J., M.B., 1921(I).
Shiel, George A., L.R.C.P. & S., 1912(I).
Shiga, Hidetoshi, M.B., 1933(For).
Shlosberg, Nathan, M.B., 1033(E).
Short, Richard C., M.B., 1927(I).
Shutt, Jonathan, M.R.C.S., 1925(E).
Sieff, Samuel, M.B., 1922(S).
Simon, Keith M. B., M.B., 1915(Col).
Simpson, Alexander B., M.B., 1899(S).
Simpson, Frederick H., M.B., 1894(E).
Singer, Arthur L., M.R.C.S., 1907(E).
Sinha, Ugra P., M.R.C.S., 1929(E).
Smith, George, L.R.C.P., 1876(I).
Smith, George C., M.D., 1872(E).
Smith, Gilbert T., M.R.C.S., 1881(E).
Smith, Hubert, M.B., 1926(E).
Smith, Issachar R., M.R.C.S., 1914(E).
Smyth, Edward W., M.B., 1902(S).
Smyth, George J. C., F.R.C.S., 1914(E).
Snijman, Esaias R., M.B., 1904(S).
Solomon, Nathan, M.R.C.S., 1930(E).
Souter, James, M.B., 1902(S).
Southern, Francis G., M.R.C.S., 1885(E).
Speedy, Isabella H., M.B., 1923(I).
Spurrier, Alfred H., *C.M.G.*, *O.B.E.*, L.R.C.P., 1891(E).
Stansfeld, Elsie, M.R.C.S., 1916(E).
Starkie, Ernest T. W., M.R.C.S., 1929(E).
Steele, Duncan J., L.R.C.P. & S., 1917(I).
Stephens, Robert S., L.R.C.P. & S., 1907(I).
Stephenson, Kathleen E. V., M.B., 1926(I).
Sterne-Howitt, Harold, M.R.C.S., 1916(E).
Steuart, William, M.R.C.S., 1911(E).
Stokoe, Lucy, M.B., 1928(E).
Stoney, Robert T., L.R.C.P. & S., 1917(I).
Story, Alfred C., L.S.A., 1905(E).
Stott, William A., M.B., 1890(E).
Strahan, Stuart S., M.B., 1909(E).
Stuart, Annie R., M.B., 1924(S).
Stuart, John, M.B., 1924(I).
Svensson, Robert, M.B., 1908(E).
Sweet, William S., M.B., 1904(E).

Tate, Arthur L., L.R.C.P., 1876(E).
Taylor, Shephard T., M.B., 1865(E).
Tha, Richard R. H. O., L.M.S.S.A., 1915(E).
Thomas, David H. H., M.R.C.S., 1932(E).
Thomson, Ian C., M.B., 1923(S).
Thomson, John G., L.R.C.P. & S., 1893(S).
Thornton, Patrick A., M.B., 1929(I).
Tizard, Henry J., M.R.C.S., 1890(E).
Tremble, John, M.B., 1911(E).
Trotter, Dorothy I. (formerly Henry), M.B., 1924(I).
Trotter, George J. E., L.R.C.P., 1886(E).
Trotter, Ninian G., M.D., 1889(E).

van Niekerk, Sebastian V., M.B., 1906(S).
van Ziil, William J., M.B., 1926(I).
van Zyl, Andries B. W., M.R.C.S., 1925(E).
Varley, Minnie F., L.R.C.P. & S., 1926(S).
Varughese, Mangattu K., M.B., 1904(E).
Verheyden, Walravine J., L.M.S.S.A., 1922(E).
Verver, Bernard T., M.R.C.S., 1911(E).
Vigne, Alfred, M.D., 1890(I).
Viviers, Philip R., M.R.C.S., 1925(E).

Wadsworth, Guthrie M., M.B., 1923(E).
Wall, Winifred E., M.B., 1926(S).
Walsh, James, M.B., 1925(I).
Walsh, Una, M.B., 1921(I).
Walsh, Vincent G., M.B., 1921(E).
Walt, Maurice L., M.R.C.S., 1933(E).
Walters, St. D. G., L.R.C.P., 1881(E).
Wang, Chung C., M.D., 1914(S).
Ward, Charles, F.R.C.S., 1876(E).
Ward, Howard P., *M.B.E.*, M.B., 1887(E).
Warren, Charles F., M.R.C.S., 1891(E).
Warrington, William O., M.B., 1925(I).
Watkins-Baker, Lionel C., M.R.C.S., 1912(E).
Watkins-Pitchford, Henry O., M.R.C.S., 1924(E).
Watson, Thomas A. N., *M.C.* (formerly Watson, T. A.), M.D., 1910(I).
Watson, William H., *M.C.*, L.M.S.S.A., 1911(E).
Weakley, Arthur, M.R.C.S., 1879(E).
Webner, Ralph A., M.B., 1925(I).
Wedgwood, William B., M.R.C.S., 1887(E).
Welchman, Edward, M.R.C.S., 1872(E).
Wells, William G. P., M.B., 1927(E).
Wesson, Reginald A., M.R.C.S., 1931(E).
Weston, Alfred W., M.B., 1914(E).
Weston, Joseph T., L.R.C.P., 1885(E).
White, Edmond, M.B., 1922(I).
Whitsitt, Leslie M., M.B., 1925(I).
Wicht, Johan F., M.B., 1920(I).
Wickham, Harrie B., L.R.C.P., 1907(E).
Wilkie, Dorothy M., M.B., 1924(S).
Williams, John R., M.D., 1922(S).
Williams, Sybil O., M.R.C.S., 1929(E).
Williams, William G., M.B., 1899(S).
Willson, Howard S., M.B., 1893(E).
Wilson, Albert A., M.R.C.S., 1930(E).
Wilson, Cecil S., M.B., 1921(I).
Wilson, William C., F.R.C.S., 18[illegible](S).
Winch, Eric W., M.R.C.S., 1928(E).
Wood, Howard J. F., L.M.S.S.A., 192[illegible](E).
Wood, John, L.S.A., 1893(E).
Wood, Norman W., L.M.S.S.A., 192[illegible](E).
Woods, William M., L.R.C.P. & S., 1906(I).
Worts, Stanley E., M.R.C.S., 1893(E).
Wright, Claude R., M.B., 1912(E).
Wulfsohn, Max, M.B., 1923(I).

Xavier, Marguerite A. M., M.B., 1925(E).

Youakin, Mikhail, L.R.C.P. & S., 1926(E).
Younan, William, M.B., 1882(S).
Young, Douglas J., M.R.C.S., 1929(E).
Young, Edward H., M.D., 1885(E).
Young, James, L.R.C.P. & S., 1909(S).

PANEL AND CONTRACT PRACTICE

Changing Doctor: the Problem of Clause 4 (4)

When an insurance committee, after consultation with the panel committee, are satisfied that owing to the continued absence or bodily or mental disability of an insurance practitioner his obligations under the terms of service are not being adequately carried out they may with the consent of the Minister give noticed to the insured persons on his list that the practitioner is no longer in a position to carry out his obligations under the terms of service. So runs Clause 4 (4). In a case of continued absence—for which phrase abandonment of the practice may be substituted—committees usually inform the insured persons that they may select another doctor, assuming of course that the panel committee have been consulted and the Minister has given his consent to Clause 4 (4) being brought into operation. But in a case of physical presence, accompanied by bodily or mental disability, the committee may give notice that the practitioner is no longer in a position to carry out his obligations, but they can neither scatter the practice nor remove the doctor's name from the list. The unfortunate insured person who has received the notice must either continue to obtain treatment from the doctor who, he has been told, is (so to speak) not up to the job or else he must go through the solemn ritual of transferring by consent. This farcical position is doubtless due to the fact that when Clause 4 (4) was drafted insured persons could transfer whenever they liked, in exactly the same way as private patients, but with the advent of Article 16 (1) of the 1928 regulations transfers locally can be effected only if both doctors consent in writing, or alternatively if the consent of the insurance committee has been obtained. So if the patient goes to another doctor—surely the obvious thing to do—he must pay for the privilege until he can secure a transfer which may not become valid for perhaps four months.

An insurance committee in the Midlands being dissatisfied with the position has had it referred to its medical service subcommittee to consider whether an attempt should not be made to secure the removal of the doctor's name from the medical list. Article 34 of the regulations gives the committee power, after an investigation by the medical service subcommittee, if they are of opinion that the continuance on the medical list of the practitioner will be prejudicial to the efficiency of the medical service of the insured, to make representations to that effect to the Minister. But Article 47 clearly provides for representations being made in other ways—and by other persons and bodies—and so cases may well arise in which Clause 4 (4) having been invoked upon the recommendation of a medical benefit subcommittee a representation may be made upon the request of the same subcommittee, or indeed by the insurance committee itself.

This point was brought out in an inquiry held in 1923, where counsel for the respondent submitted a preliminary objection to the inquiry proceeding on the grounds that under the terms of the 1923 Medical Benefit Regulations an insurance committee were *not* competent to bring forward and ask for the hearing before the inquiry committee of a representation owing to the fact, which was afterwards proved in evidence, that no investigation of the matters alleged against him in the representation had taken place before the medical service subcommittee. The inquiry committee over-ruled the objection, holding that Part VI. of the regulations formed, in a sense, a separate code under which the committee could themselves move *de novo* for an inquiry by representation and that the terms of Articles 41 and 42 of those regulations enabled them to proceed without a preliminary investigation or report by the medical service subcommittee. The inquiry committee pointed out that the terms of the regulations lacked clearness in a certain degree on this point in that a declaration of the substantive right of the committee to make a representation of the kind under review was actually found in Article 30—a regulation dealing with investigation by the medical service subcommittee—and that the power to make a representation under Part VI., if that part were rightly viewed as a separate code, was expressed somewhat hypothetically in Article 42.

The respondent in this case applied to the King's Bench division of the High Court to have the decision of the Minister quashed, the principal ground of the application being that the insurance committee had made representations without first directing an investigation by the medical service subcommittee and that the whole of the proceedings were thereby vitiated. But the case was dismissed with costs.

It seems ludicrous that insured persons should be compelled to obtain treatment from, and that insurance committees should have to pay, doctors who have been found by the Minister, the insurance committee, and their professional colleagues on the panel committee, to be unfit to perform their duties.

Costly Certificates

There are probably few insurance doctors who are not asked from time to time to issue certificates of incapacity in respect of patients they have not seen during the previous 24 hours, and possibly there are fewer still who could be certain that they had never done so. A few weeks ago the London medical service subcommittee dealt with two such cases. In the former the doctor had issued weekly certificates to the wife of an insured patient whom he knew was an inmate of a sanatorium, "being under the impression that he was required to supply such certificates even though he had not seen the patient." A para-ph from the subcommittee's report sums up the ition as follows :—

> ule No. 9 of the Medical Certification Rules provides : a practitioner having issued a certificate under the s shall not issue a further certificate without again mining the insured person. The facts of the case were iitted by the practitioner, and it is clear that he, in travention of the rule referred to, issued certificates in ect of the insured person on dates on which he did see him and when, as a matter of fact, the insured son was an inmate of a sanatorium. The practitioner ns to have given the certificates without a due sense esponsibility and to have failed to appreciate that the ited words on the form of certificate issued for the use practitioners contain a statement of fact. It appears us that the practitioner could not have been under illusion when he put his signature to statements ch were not true, namely, that he examined the patient dates when he had not seen him. No question arises to the continued incapacity of the insured person, it is a matter for surprise that a practitioner who has n on the Committee's Medical List for many years should have been so ignorant of the requirements of the Medical Certification Rules.

In the other case, also of a patient suffering from a tuberculous condition, the patient obstinately refused to follow the line of treatment prescribed for him, although the doctor did his best to meet his various predilections, and eventually it became clear that it was useless to make further visits to a patient who would neither take his medicine nor carry out the treatment prescribed for him. But the man was incapacitated and the doctor yielded to the requests of the wife that he should issue certificates hoping throughout that the patient would change his mind and agree to accept appropriate treatment.

Both doctors are likely to be poorer to the extent of £2 as the result of what they no doubt regarded as a technical error, but which the service subcommittee had no option but to treat as a breach of the terms of service.

PUBLIC HEALTH

ie Future of the Health Services in Scotland

[N his presidential address to the congress of the yal Sanitary Association of Scotland, Dr. G. Y. T. Michael, medical officer of health for Paisley, elt upon the need for unravelment of the present nfusion of the health services, and the enrolment the general practitioner in a service the first ject of which would be preventive rather than rative. The general practitioner, he suggested, will quire to put away much of the strongly individual-ic attitude of his predecessors, and become a it in a large team. In an organised service his rk would be easier and certainly more interesting, r he would have at his back all the resources of a mplete medical service, including an adequate ursing service, to assist him in his domiciliary work. ie existing medical services made practically no ovision for a large number of the population who e not in a position to provide for themselves; t one of them was complete, and their adminis-ation was divided among different authorities hich did not coöperate with one another. The me had arrived for a planned national policy, gulating the development of all the health services, a way comparable with the coördination and ganisation of educational effort. It should aim at) a complete environmental health service, and (2) a mplete national medical service, to the benefits of hich every member of the community should have ccess. The distinction was one of convenience; he two branches were essentially interlinked. Dr. IcMichael, discussing the relative merits of a whole-ime salaried service, as compared with a develop-ient of the panel system, came down definitely on he side of the latter, partly because of the personal ond between patient and doctor which free choice reserves, and partly because of the detrimental ffect upon efficiency and the lack of incentive in a vhole-time service, where promotion must depend argely upon seniority. As part of the national rovision for health there should be a maternity cheme managed by the local authorities, affording fficient midwives, competent medical care, and dequate institutional beds to meet the requirements f every expectant mother. Some way must be ound of bringing the voluntary hospitals within the cope of a national service without destroying their individuality and voluntary character. There must be much more active and definite coöperation between the managers of these institutions and local authorities than there has been in the past.

Criticism of the present divisions of local government and proposals for reform have been much bolder in recent years in Scotland than south of the Border. Dr. McMichael, in his address, dwelt upon the necessity for unifying all the medical and health services under one authority. The congress devoted the remainder of the session to discussing the evolution of local government. In a paper on this subject Dr. John Ritchie, medical officer of health for Dumfriesshire, traced the history of local government in Scotland, and pointed out that health authorities of the future must have at their disposal all the resources of modern medical science. Some measure of combination or unification of the present numerous authorities seemed inevitable. Dr. C. W. Sleigh, vice-convener of the county of Aberdeen, described the regional medical scheme at present in operation in Aberdeen, city and county, and the county of Kincardine, which preserved autonomy but ensured the greatest measure of coöperation between the city and the counties. Schemes of this kind, breaking down barriers between the counties, cities, and small burghs, and pooling the hospital and specialist resources of areas, were essential to the development of the medical services. He supported the regional scheme advocated by the Scottish Department of Health, centred on Inverness, Aberdeen, Dundee, Edinburgh, and Glasgow, which has already been described in these columns.[1]

In the discussion of these papers, Bailie Stewart Reid, convener of the public health committee of Glasgow, referred to the new arrangements for domiciliary medical assistance of the poor in that city. It had been decided to abolish all part-time service for this purpose and establish a staff of whole-time practitioners. The day of private practice was past. National health insurance, he was satisfied, had served its day and generation, but was now obsolete. He was convinced that a whole-time service would come, and Glasgow's recent decision was a step toward it. This point of view is not uncommon among the lay members of local authorities, and the reactions of the public in Glasgow and in areas where the open choice system has been adopted will no doubt be studied carefully by the government departments concerned.

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[1] THE LANCET, 1935, i., 887.

Infection in Swimming Baths

Scarlet fever, although maintaining its usual low summer prevalence, has been occurring throughout August at a level rather above expectation. In Chelmsford it has suddenly taken epidemic form at an unusually early period in the season. From an incidence of one to two cases per week during the summer, notifications increased to 9, 223, and 58 in the weeks ended August 24th, August 31st, and Sept. 7th respectively. Figures of this order clearly indicated some special source of infection, which has proved to be a milk-supply, with regard to which particulars are not yet available. Among the steps taken to prevent the further spread of infection, the corporation swimming baths have been closed from Sept. 13th until further notice, on the recommendation of the medical officer of health, Dr. J. C. Sleigh. It would be interesting to know whether there has been definite epidemiological evidence that the disease has actually been spread in this way in Chelmsford. In a fairly exhaustive survey of the literature of the subject[1] written by Dr. J. Alison Glover and other officers of the Ministry of Health in 1929, while the possibility of such an occurrence was mentioned in connexion with small crowded and polluted school baths—and it was recorded that Dr. Griffith had been successful in isolating a hæmolytic streptococcus from one of four samples of bath water submitted for the purpose—it was pointed out that remarkably little had been heard of the transmission of scarlet fever and other nasopharyngeal infections by swimming baths. Since then nothing has happened to call for qualification of this statement.

In times of emergency extraordinary measures must often be taken to allay public alarm. It is clear that the risk of infection is always greater where many young people congregate. Covered swimming baths are often crowded and ill-ventilated. Bathers, becoming chilled and temporarily deprived of the protective secretions of the mucous membranes of their nasopharyngeal passages, may be more than normally susceptible to infection. On general grounds therefore there is justification, during an exceptional epidemic of scarlet fever, for closure of swimming baths belonging to a public body, although other centres of perhaps equal risk cannot so easily be dealt with because of their private ownership.

A Curious Epidemic of Sore-throat

The Northampton coroner inquired on Sept. 9th into the death of a 13-year-old girl, one of a family of six children at the village of Badby, all of whom had been taken ill. The sequence of events was this. The first case was a girl, aged 6, who sickened on August 17th and recovered. The second, a boy aged 8, was taken ill on August 18th and died at home on the 23rd, the cause of death being certified as cardiac failure, septicæmia, streptococcal infection of tonsils and fauces. The third, a girl aged 13 (the subject of the inquest), fell ill on August 19th. A swab taken from the throat proved negative for diphtheria. The child was removed to Northampton General Hospital where she died on August 25th, the cause of death being certified as cardiac failure due to spirochætes of Vincent's angina. The fourth, a boy aged 13 months, taken ill on August 29th, t once removed to the general hospital where throat swabs proved positive for diphtheria and the child was transferred on Sept. 17th to the Staverton Isolation Hospital. The fifth, a boy aged 12, and the sixth, a girl aged 14, were notified on August 31st and Sept. 3rd respectively as suffering from diphtheria and were removed direct to the isolation hospital, where they were both regarded without question as cases of diphtheria. Both are now doing well. A brook running through the village of Badby was blamed for the outbreak, and Dr. A. R. Darley, M.O.H. for the rural district, had the water examined both chemically and bacteriologically; it was stated to be of unusually good quality for a brook water. A septic tank which also came under suspicion has been attended to. Dr. Darley himself regards the probable cause of the outbreak to be a diphtheria carrier; the boy of 12 now in the isolation hospital may prove to have been the carrier. Father, mother, and eldest son, aged 18, in the affected family remain well.

The Keeping of Records

Practitioners may still be heard to complain about the record keeping that the insurance medical system imposes upon them. Yet when they were students they were taught, as clinical clerks, to note the salient facts of a case for future reference. Where patients or problems are handled from time to time by different—and changing—members of a team, accurate recording is the essence of an intelligent and continuous service. Public health workers are thus accustomed to the use of record forms and learn to appreciate their value. Forms are to administration what machinery is to industry; they enable an object to be reached with the minimum of effort. Red tape, often a term of opprobrium, is an effective part of departmental machinery so long as it is used to bind the records and not the minds of its officers.

In one public health department, where a serious effort is made to scrap unnecessary forms periodically and to avoid the needless introduction of new ones, the number of different forms is found, we are told, to total more than 250. These, it should be understood, include various legal notices, intimations to parents, and the like, but the number of forms needed purely for record purposes is large. Many have been devised to suit what appeared to be the requirements of the department and are not based on any model, although in certain services, like that relating to the health of school-children, the returns required by government departments govern the forms of local records. In this connexion a book published by the Commonwealth Fund[1] should be of some help to medical officers in this country, although it is designed to suit American conditions. It discusses the desirability of uniformity of record keeping in health departments, and suggests the most useful forms which might be used for various purposes. Model forms are presented in 79 figures, and the Commonwealth Fund offers permission to health agencies, on application, to use them under its copyright. Public health officers will find in it much useful guidance.

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ification of the Water of Swimming Baths. H.M. 1929.

[1] Recording of Local Health Work. By W. F. Walker and C. R. Randolph. London: Oxford University Press. 1935. Pp. 275. 8s. 6d.

Rebuilding a Leeds Hospital.—Leeds corporation health committee have approved plans for modernising and extending St. James's Hospital at an estimated cost of over £110,000. This should relieve the overcrowding at Leeds General Infirmary. The plans include a pathological block, operating theatres, and a nurses' home.

CORRESPONDENCE

MANDELIC ACID

To the Editor of THE LANCET

SIR,—Since the publication of my preliminary xperiments on the use of mandelic acid in the reatment of urinary infections (THE LANCET, 1935, ., 1032) a more extensive series of cases has been reated with satisfactory results. In the original paper a warning note was added concerning the occurrence of casts in the urine of patients under reatment and since then casts have been found in the urine of a number of other cases. These have been both hyaline and granular in nature and have occasionally been accompanied by albuminuria. On stopping the treatment the casts and albumin have, in every case, promptly disappeared and no evidence of any impairment of renal function has been obtained.

The occurrence of casts in an acid urine, such as is produced by these patients, is of doubtful pathological significance. Recently some evidence has been obtained that the renal irritation responsible for the formation of the casts may be due to the ammonium chloride rather than to the mandelic acid, and it is therefore suggested that the treatment be started with a daily dose of four (instead of eight) grammes of ammonium chloride, which should only be increased if the urine does not become sufficiently acid.

In any case, as previously emphasised, the occurrence of casts or of albumin is an indication that the treatment should be pursued with caution and it should be remembered that the use of ammonium chloride is always inadvisable in the presence of renal failure.

I am, Sir, yours faithfully,
M. L. ROSENHEIM.

Hampstead, N.W., Sept. 21st.

ARTIFICIAL RESPIRATION

To the Editor of THE LANCET

SIR,—I read with interest the leading article in THE LANCET of July 20th based on my article on the best method of manual artificial respiration in the same issue, and I was glad to learn that you think I have made out a good case for preferring Silvester's method to Schäfer's. However, you add that any method which is to be generally adopted should be easily learned and applied by unskilled persons and that in this respect Schäfer's method has the advantage. I grant you this, but before a method can be recommended it must be established that its physiological basis is good, and this is the more essential because it is difficult to draw conclusions from the results of applying any method in ordinary practice. Prof. Henderson has often pointed out that, in cases of so-called apparent death, as a rule it is not known what the condition of the patient was, when he was seen for the first time, because assistance was given by laymen before any doctor was able to determine it. In many cases of apparent death, treated with alleged success, my experience at the Dutch Society for Saving Drowned Persons makes me doubt if the respiration really stopped entirely and if no pulsation was to be felt; in most cases the reflexes were certainly still present, and in such cases various kinds of simple manipulations might have been successful.

My next point is this. Bruns, whom I quoted in my paper, has demonstrated that if in an apparently dead person the reflex irritability is abolished and the respiratory centre does not react to stimuli, no method of artificial respiration can be effective unless it causes blood to flow from the great veins to the right heart and thence through the lungs to the left heart; and Bruns's investigation showed that Silvester's method—and in a lesser degree Howard's method—does this, whereas Schäfer's method does not. It is an established fact that, when a cadaver lying on its back is turned over, the manometer registers a positive blood pressure of 12 cm., which remains fairly constant in spite of strong expiratory pressure; this alone is sufficient to condemn Schäfer's method and other methods in which the apparently dead person is laid on the abdomen. Bruns's experimental investigations were strictly controlled. They have been confirmed by Thiel, and as long as they are not disproved—and Prof. Henderson has not done so—they remain valid.

In my capacity of Secretary-General of the International Association I welcomed the opportunity of publishing an article in your columns, as it seemed to me that some German and Scandinavian publications were not sufficiently known to English and American writers. For collaboration in war-time and at great disasters, it is of international importance to know which method is most to be recommended, and this can only be solved by world-wide collaboration.

Prof. Henderson claims that "no method of manual artificial respiration can do more than induce rhythmic expirations," but he does not support this opinion by argument; and the investigations of Ploman, Liljestrand, Bruns, and others, besides myself, prove the contrary. Prof. Henderson also expresses the opinion that when artificial respiration is being done the inspirations which occur between the forced expirations are due solely to the tonus of the victim's own muscles, and this view is also contrary to the experience of the investigators I have mentioned. Prof. Henderson points out himself in your next issue (page 178) that the muscular tone in an apparently dead person, in whom reflex irritability is abolished, is very low and soon reduced to zero. The muscular tonus of young vigorous students which he mentions is therefore irrelevant.

Elsewhere (Münch. med. Woch., 1935, i., 2) I have set out why the methods of Jellinek and of Holger-Nielsen present no advantage.

I am, Sir, yours faithfully,
Amsterdam, Sept. 12th. C. J. MIJNLIEFF.

*** We have received from our Australian correspondent a letter in which he says: "Dr. Mijnlieff's contention that the Silvester method of resuscitation is preferable to the Schäfer will find few supporters in Australia, where experience in the treatment of drowning is comparatively large and the Schäfer principle is the only one extensively taught. The beaches, where millions of people spend their weekends bathing each year, are patrolled by members of the Surf Life Saving Association of Australia. During the ten years 1925–1935, this association has records of resuscitation by a slight modification of the Schäfer method on 1471 patients; actually no death from drowning occurred on any beach whilst a patrol was present. Rapidity of rescue must be a factor in such success, but much of the credit is undoubtedly due to the method of resuscitatio
The rate of 12 per minute adopted by the associati

was determined by a medical committee after a series of experiments carried out at Sydney University by Prof. H. Whitridge Davies, who found that 15 per minute, the rate previously used, produced considerable over-ventilation. A comparison was also made in these experiments between the Schäfer and the Silvester methods, from which the conclusion was drawn that the Schäfer method was to be preferred."—ED. L.

BACTERIOLOGY OF RHEUMATISM

To the Editor of THE LANCET

SIR,—I am very grateful to Prof. Wilkinson for giving me the clue to Dr. Mantle's paper, and for his kindly personal reference. His letter stirred my subliminal consciousness, and a vague memory of 35 years ago bid me to look up THE LANCET, 1900, ii., 1306, where I found a letter signed by the late Dr. Alexander Paine and myself. I quote a few essential lines.

> "To Dr. Mantle we owe an apology. . . . There can *be no doubt that in 1887 Dr. Mantle* fully recognised the likelihood of rheumatic fever being due to an infection, and that he further carried out some important and laborious investigations in support of his contention."

The nature of these was indicated in that letter, and are given by Prof. Wilkinson.

At the present time, thanks to the paper by Schlesinger, Signy, and Amies (THE LANCET, 1935, i., 1145), upon a possible virus causation, the whole question of the ætiology of rheumatism has been revived, and with energy—perhaps with forgivable energy—I fought for the work and results of those who had pursued the streptococcal causation. It is very right that Dr. Mantle's work of nearly 50 years ago should be recalled, for it was then that some of our great clinicians were from bedside study and post-mortem evidence teaching us that acute rheumatism was probably due to infection.

I am, Sir, yours faithfully,

Bath, Sept. 21st. F. JOHN POYNTON.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—In Dr. Thaysen's paper (August 3rd) and the full correspondence which it elicited I have seen no reference to epilepsy. I have noted statements in the correspondence which bring some of the cases referred to into line with that which is described below, which I believe is one of epilepsy. I have not myself observed the evidence. Dr. Thaysen wrote of one patient that the pain sometimes waked him, and ceased suddenly; of another, with associated epigastric discomfort, that he became cold and perspired; of another, with similarly associated visceral symptoms, that he fainted. Proctalgia in one of his patients followed coitus and was succeeded by fainting. He quoted two instances in which a parent and child had proctalgia. Dr. Ryle (August 10th) alluded to the incidence of the pain with sleep. Dr. Blyth (August 17th) referred to two cases in which the pain developed soon after masturbation. Dr. McEwan (Sept. 7th) wrote of associated coitus interruptus, and another correspondent referred to proctalgia in brothers, sufficient to cause unconsciousness. Lastly, Dr. Marshall (Sept. 14th) quoted a case in which he finally relieved the pain by amyl nitrite, a remedy for several states, but which the neration of physicians relied on for the abortion tic attacks.

ot suggest that proctalgia fugax is necessarily an epileptic phenomenon, but there seem to be cases in which it is the aura and, at times, the entire epileptic manifestation. It is true that the case I now relate is my only example, but for many years I have known, from a source which I do not recall, of the reality of the rectal visceral epileptic aura.

When I first saw Mrs. B., aged 37, in April last it was rectal pain which worried her; the subsequent attacks of fainting, for which she was sent to me, bothered her much less. She did not know of the possibility of epilepsy. There was no detectable lesion at the local examination on which she insisted, and she shows no evidence otherwise of disease elsewhere. Mental failure was prominent on her father's side. She denied anal coitus. At age 6 she was taught to masturbate, and the habit persisted with regularity for the next ten years. At 10 she had a severe solitary attack of proctalgia, similar to the pain she has now. Because it occurred directly after masturbation she said nothing about it. The menses started at 11; they have continued regularly and are unrelated, in her view, to the pain or to the attacks. At 15½ she fainted on a lawn-tennis court, without clear cause. She had no associated proctalgia, but there was diarrhœa afterwards. At 16 she married, and she has several children. At 25 the proctalgia recurred after *15 years' freedom. It occurred sometimes, but only* sometimes, directly after coitus. A little diarrhœa or the passage of intestinal flatus usually relieved her, but sometimes she fainted. Her husband was also concerned about this time because of attacks which clearly were petit mal. At 31 she had a more severe epileptic attack. Coitus, proctalgia, the fit occurred in rapid sequence.

The attacks of proctalgia, two or three a year, are rather more frequent than the fits. The pain wakes her. On rare occasions it has passed without a fit occurring. She describes it as horrible within the rectum, and sometimes spreading to the womb. It is never at the anal orifice. It makes her draw up her knees and roll about. Sometimes she sweats, and she knows by experience that a faint will then follow. Each attack of pain is similar to the others. There is a definite although inconstant link between coitus and the pain, and on two occasions the pain has waked her from a dream of coitus. The onset when she is not asleep is always abrupt; the pain lasts five or ten minutes, she thinks. If she has a fit she often finds the pain still present on recovery, but fading away. She has no remedy for the pain save the voidance of gas or a small motion. She elects to do this; there is no urgent call. She does this whether she has or does not have a fit, and she thinks that by doing so she has sometimes aborted a fit. Spontaneous disappearance of the pain, without this help, is very rare. She has never had an attack, save the faint at 15, without a preceding rectal pain. In July last she wrote: "I woke this morning at 2 o'clock with the same damned pain. I tried to fight the feeling of faintness, but I went dead off and on coming to felt sick and had the usual flatulence and motion. I went back to bed and must have slept a few minutes, as I woke again at 2.15 feeling very sick but without actual pain, only a wish to pass a motion. I put the chamber on the bed so as to be sick into it, and lay down and again fainted dead off. When I came round I found I had bitten my tongue and had dribbled. I passed a second very loose motion, then went back to bed and slept well."

The epileptic visceral aura, or the epileptic equivalent, which is commonly described is an epigastric sensation. I have seen no other case of rectal or anal aura nor, for that matter, have I ever met rectal crisis in tabes dorsalis. Perineal crisis has come before me once or twice. I am sure that Dr. Howard (August 10th) will not mind a suggestion that he modifies his need to make a test in each case of obscure rectal pain, so as to exclude tabes dorsalis, for we know that tests often fail, at the time they are made, to confirm this correct clinical diagnosis.

Dr. Carter's note (August 17th) interested me.

His patient had pain and other symptoms in a foot which, later on, were associated with rectal pain, although never at the same time. He wrote that a single lesion, causing pain at the two sites, provided an interesting speculative study in neurological localisation.

In February, 1933, I saw a six-year widow aged 44, with one child, who complained that for four months she had pain throughout the second and third toes of the right foot, and in these alone, directly before and during every act of defæcation. It then passed instantly. It was no more than a nuisance to her. Dilatation of the anus, from within or without, did not increase the pain. It occurred whether the fæces were solid or liquid, also with the passage of gas alone and sometimes when the toilet paper made contact. There was no pain or tenderness at or near the rectum, but bi-digital compression of the tissues between the rectum and vagina, at a certain spot, caused instant pain in the two toes. There was no detectable local disease, but she had some slight clinical evidence which suggested insular sclerosis. Her story of the pain, although unusual, was clearly genuine, and I regarded it as referred along the musculo-cutaneous nerve, but from a lesion in the lower sacral plexus.

I do not know why two toes alone were involved. She was treated, at a time the pain was present, by a large epidural injection of warm saline, made through the sacro-coccygeal ligament. The pain was relieved immediately and, save for a slight return six weeks later, with spontaneous recovery, it has never recurred. She remains well. The clinical signs which suggested spinal cord disease are unaltered. The sensory side which, objectively, was healthy remains so.—I am, Sir, yours faithfully,

Harley-street, W., Sept. 21st. HILDRED CARLILL.

T.A.B. VACCINE FOR GONORRHŒA

To the Editor of THE LANCET

SIR,—I should like to bring to the notice of my medical colleagues a form of treatment for gonorrhœa with which I have had excellent results. I am not claiming to introduce something new, as protein-shock therapy has been in vogue for some time. What I do claim is that a fresh infection of gonorrhœa can be cured within two weeks. The gonococcus, as is well known, is a delicate organism, which cannot survive at a temperature of 104° F. and above. My experiments were suggested by the observation that some patients under my charge who developed malaria had a speedier recovery from gonorrhœa than their fellow patients. The method is this:—

On admission the patient is put to bed on a milk diet and given an intravenous injection of 0·25 c.cm. T.A.B. vaccine in 5 c.cm. sterile normal saline. In about an hour he develops a typical malarial attack, the temperature usually rising to 103–105° F. The next day the patient as a rule is quite normal, but some complaint of slight headache may be made. The injections are repeated every third day, the dose of vaccine being increased by 0·25 c.cm. each time. By the third injection the patient is "dry." Three injections usually suffice; I have given four in one case only. In conjunction with these injections local irrigations are given twice daily of a weak (1:10,000) solution of pot. permang. and an alkaline mixture taken internally. On the day of injection no other treatment is given.

Chronic cases also do quite well on this form of treatment, but as there is usually a mixed infection the results are not so striking. The gonococci however disappear after the first or second injection. No after-effects whatever have been noted, and the treatment is quite safe and harmless.

I am, Sir, yours faithfully,

Simla, India, August 29th. A. H. BARTLEY.

THE DRUG HABIT

To the Editor of THE LANCET

SIR,—That hardy annual, the cost of medicines for insured persons, has again flowered. There appears to be no perceptible difference in this year's blooms when these are compared with those of last year, and the year before that, and the year before that, and for years and years and years, as the curate of army concert parties used to say. Surely it is time this plant exhibited some floral variation, even if only by way of a freak bloom. Is it not just possible that what that expert gardener, the late C.M.O. to the Ministry of Health, has gone on all these years regarding as a weed may actually not be a weed at all, but a plant indigenous to the English soil?

When we are told that in Scotland the cost per head of insured persons' medicine is only two-thirds the cost per head in England, let us assume that doctors here and even in Scotland know their business and give their patients not what the patient thinks he or she wants, but what the patient in the doctor's opinion needs. Any other opinion, even if it does emanate from an official of the Ministry of Health, seems to imply that practitioners disregard their obligations to provide necessary treatment. Surely here we have a fact of some importance; roughly, the Scottish population needs two-thirds the medicine the English population of the same size requires. Is there, for one thing, less prolonged illness in Scotland? If a man there takes ill with what may be his last illness, does he die more quickly? If he does, the resistance to infection of the Scottish population is considerably less than that of the English; which would imply that the standard of public health in Scotland is two-thirds that in England; and that increase of resistance due to public health measures is likely to result in increased costs of medicine because with increased resistance on the part of the population illnesses late in life are likely to last longer. Or is it that when a man takes serious ill at the end of his life he is, in the old fashion century ago, "given over" by the physician tious the administration of drugs stopped? This pr small-if readopted in England, would decrease th 1151; of drugs. Again, with a man recovering from ary or illness, it is sometimes wise to continue trea rperal acute of one kind or another for a week or so after h alitis resumed work. If in Scotland, or in those En tery, areas where costs are low, treatment is stopped wera, the man is sent back to work, this suggests the some people may suffer unduly through the cessati of treatment too soon. on 1:

A good deal of information is obviously obtainab from these figures, once they are taken seriously as representing the real requirements of the population. I am happy in possessing a dispensing practice, and from May 1st, 1934, to April 30th, 1935, the average cost of drugs per prescription was 6·62 pence, as compared with the average cost of drugs in prescriptions dispensed by chemists of 3·677 pence for the whole country for 1934. I know the reason for the higher cost here than that in the chief part of the country. In the first place the figure 3·677 pence applies to persons living within a certain distance of a chemist—admittedly the bulk of the population, but people living and working usually under good conditions. Dispensing practices naturally cover populations scattered in small and often old cottage and working exposed to the elements; their dr costs are likely to be heavier, since this popu tion will take ill more severely or more of than one living under better conditions. In this district conditions are distinctly bad, even for the country. The result is a drug-cost per prescription practically twice that for urban populations; to take one example, grs. 10 or 15 of salicylate of soda are needed where I personally should use 7½ in a town.

The explanation which knowledge of actual conditions prompts for these drug figures in my individual practice is borne out by other figures. In an insured population of about 650 there were in the same period 690 panel visits and 2140 panel consultations. Taking 40 per cent. as the number of patients one may expect to see in the year, this would give 690 visits and 2140 consultations to be divided between 260 people. This is 2·65 visits and 8·23 consultations for *each* of these 260 people; or, if it assumed half were sick at home and half came to the surgery, 5·30 visits per person treated at home and 16·46 attendances at the surgery for persons treated there. The last figure is obviously too high; clearly more than 260 insured persons were treated in the year; and these figures, with a low visiting figure and a high consultation figure, show that people are doing what they should, and attending for treatment in the early stages of their illnesses. Treatment then, which means buying drugs for them, certainly lessens the severity of illness and probably lessens its duration, and may keep a man at work. If the man waits till he is too ill to work before seeking treatment the visiting figures go up and the drug figures do not go down, for it will take at least the same amount of drugs to put him right then as it would do to treat him if he seeks treatment when he should. In other words, the drug expenditure prevents a good deal of payment of sickness benefit by the approved societies.

It would be worth while to correlate the figures of sickness benefit payments in the areas where drug costs are low with those in the areas where drug costs are high; but, particular points like this apart, if I can account for my high drug costs by knowing what actual conditions here are, is it not possible t similar explanations may be available for the tions within England? Sometimes "comparable " are not really comparable; and I cannot her to have seen an assessment of the whole insured persons, including sickness benefit nt, for "comparable areas."

I am, Sir, yours faithfully,

C. T. NORRIS.

nea, March. Cambs., Sept. 21st, 1935.

THE DOCTOR AS ADMINISTRATOR

To the Editor of THE LANCET

SIR,—It may be of interest to relate my practical experience in support of the view that the doctor ought to be an administrator, as this is the best way to bring full prosperity and success to any medical institution. I have held the position of not only chief physician but director of the Imperial sanatoriums in Russia. These sanatoriums covered a very big area, more than 1500 acres. There were more than a hundred buildings, including quarters for doctors, male and female nurses, and employees. We had our own church, electric station, water station, post and telegraph office, a big farm, with more than fifty cows, poultry, and so on.

Every department had its own head, but the whole administration was governed by the chief physician. eek there was a committee meeting under hip of the chief physician in his capacity . The committee consisted of the doctors, heads of all departments, secretary, treasurer, book-keeper, architect, and even a priest. Questions on all matters that cropped up were put before the committee and the opinion of everybody concerned was asked. Short discussion followed, and the final decision by the director—i.e., the chief physician—was declared and put in writing. Such matters as canalisation, purchase of a new dynamo, church furniture, plans for the new buildings, all went to the committee for final decision.

During all the years that I acted as assistant physician, chief physician and director, I cannot remember any dissatisfaction or any inefficiency. I have published a book (a copy of which may be found in the British Museum) about the administration of Imperial sanatoriums in Russia in 1913, and the conclusion is that in order to attain a high standard in medical institutions the doctor ought to be an administrator.—I am, Sir, yours faithfully,

London, Sept. 21st. B. A. PEROTT.

VACCINATION ON THE THIRD DAY

To the Editor of THE LANCET

SIR,—Dr. Paterson is very dogmatic about the harmfulness of vaccination and circumcision in the first three weeks of an infant's life. Coming as it does from an authority on children's diseases, this pronouncement is bound to influence profoundly the action of would-be circumcisors and vaccinators, with the result that many infants will be left unvaccinated and uncircumcised until the necessity for one or both has been forgotten by the person interested in the welfare of the infant. One instance is hardly enough evidence to condemn the practice. In my own experience, amounting to nearly 800 cases of circumcision and vaccination performed within ten days of each other in the first three weeks, I have never had cause for regret. The Jewish race could hardly be so well established, and increasing, if early circumcision were detrimental; their method allows an almost bloodless operation to be carried out without anæsthetic or ligatures, an advantage that cannot be enjoyed by infants of riper months. In a similar way, vaccination performed during the first month (taking for granted that only one scarification is made) has the double advantage of a painless procedure and efficient care by the monthly nurse before she leaves the infant to the care of a nanny.

I am, Sir, yours faithfully,

AUBREY GOODWIN.

Queen Anne-street, W., Sept. 19th.

AMOUNT OF HÆMOGLOBIN IN THE BLOOD

To the Editor of THE LANCET

SIR,—The paper from the medical unit at the London Hospital in your issue of Sept. 21st will be most valuable to hæmatologists. I have been for some time endeavouring to find a method of determining the percentage of hæmoglobin that can be used by the general practitioner at the bedside. For this purpose dilution methods are seldom practicable, and it is important that the observations shall be made on fresh blood.

The Dare apparatus has the disadvantage that the graduation of the scale is much too steep. Furthermore, it is originally expensive; replacement of parts is even more so, and they have to be obtained from America. The chief difficulty about the Tallqvist method, which is clinically convenient, lies in the fact that there is a considerable difference in the *tint* of different scales, some being too blue and others too yellow. If however the comparison with the blood made through a piece of green glass, the observer aving his back to the window or a domestic electric ulb and holding the glass close to his eye, the difference in tint is substantially eliminated and the eading can be made, as it should be, by *tone* only.

I have experimented with many shades of glass nd numerous Tallqvist scales. In the result a articular shade of green was selected which answered he purpose, especially in counteracting the aforesaid ifferences between the scales. It is put up in a onvenient frame by the Hospital Contracts Co. 33, Mortimer-street, London, W.1) with a leather over, and can be carried in the waistcoat pocket.

It is not suggested that by this means an absolute etermination of the hæmoglobin content can be ade, but it is sufficiently accurate for comparative bservations in the same patient which are necessary or estimating the value of treatment.

I am, Sir, yours faithfully,
A. KNYVETT GORDON.

Bedford-square, W.C., Sept. 23rd.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. G. H. Hayes to *Pembroke* for R.N.B., mp., and to *Pembroke* for R.M. Infirmary, Chatham; . G. Rainsford to *Pembroke* for R.N.B.; and W. F. eattie to *Victory* for R.N.B.

The following officers qualified at the examination for romotion to surgeon commander held recently: Surg. t.-Comdrs. W. G. C. Fitzpatrick and W. A. Hopkins ualified for accelerated promotion), M. Barton, F. B. uinn, J. J. Cusack, and C. R. Roland.

Surg. Lt. S. Jenkinson promoted to rank of Surg. t.-Comdr.

Surg. Lt. J. W. Oliver to *Pembroke* for R.N. Hospital, t. Yarmouth.

The following have received appointments as surgeon eutenants, R.N., for short service: J. Carlton, London niversity and Guy's Hospital; J. M. Fitzpatrick, Royal ollege of Surgeons, Ireland; A. E. Ginn, Guy's Hospital; . S. Grist, Oxford University and St. Mary's Hospital; . S. Hepburn, Edinburgh University; F. H. Lamb, t. Thomas's Hospital; J. Lees, Cambridge University nd St. Thomas's Hospital; D. Shute, Victoria University f Manchester; H. G. Silvester, University College ospital; D. Simpson, Liverpool University; J. L. S. eele-Perkins, Royal College of Surgeons, Edinburgh; nd W. F. Viret, Leeds University.

ROYAL NAVAL VOLUNTEER RESERVE

W. J. Heely entered as Proby. Surg. Lt. and attached o List 2 of the Severn Division.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. C. E. L. Harding, having attained the age or retirement, is placed on ret. pay.

Maj. S. M. Hattersley, M.C., to be Lt.-Col.

Royal Hospital, Chelsea.—Lt.-Col. H. C. D. Rankin, .B.E., relinquishes the appt. of Physician and Surgeon.

Maj. C. Armstrong, M.B.E., to be Physician and Surgeon.

SUPPLEMENTARY RESERVE OF OFFICERS

Lt. J. Morgan to be Capt.

ARMY DENTAL CORPS

Capt. A. H. Kay is retired under the provisions of Art. 149, Royal Warrant for Pay and Promotion, 1931, receiving a gratuity.

MILITIA

Maj. T. W. E. Elliott retires on attaining the age limit and retains the rank of Maj.

TERRITORIAL ARMY

Capt. W. T. de V. Thomson resigns his commn.

Lt. T. A. S. Kennerley to be Capt.

ROYAL AIR FORCE

Flight Lt. A. E. Vawser to R.A.F. Depôt, Uxbridge.

The following Flying Offrs. are posted to Medical Training Depôt, Halton, on Sept. 2nd, on appointment to Short Service Commissions: A. S. Amsden, H. E. Bellringer, J. P. Carlile, C. M. Carlyle-Gall, W. J. L. Dean, T. J. M. Gregg, R. S. B. McClean, A. B. Marshall, S. R. C. Nelson, R. S. Peill, R. L. Soper, L. N. Trethowan, and J. B. Wallace.

Dental Branch.—Flying Offr. D. P. Boyle to Medical Training Depôt, Halton, on entry into R.A.F., on a non-permanent commission.

INDIAN MEDICAL SERVICE

Capts. to be Majs. (provl.): G. P. F. Bowers, J. S. Riddle, J. E. Gray, S. Smyth, and M. H. Wace.

Capt. J. M. Matthew resigns his commn.

Lt. F. W. Whiteman to be Capt.

Abdul Aziz Khan to be Lt. (temp. commn.).

Col. H. E. Stanger-Leathes, K.H.S., retires.

DEATHS IN THE SERVICES

The death occurred on Sept. 22nd at Harrogate of Surg. Vice-Admiral Sir JOSEPH CHAMBERS, K.C.B. He was born in 1864, the son of Thomas Chambers, J.P., of Bailieborough, Co. Cavan, was educated at Trinity College, Dublin, and qualified M.B., B.Ch. in 1887. He entered the Royal Navy as surgeon in 1889, served in the South African War, and was in charge of several naval hospitals. During the European War he was operating surgeon at the Royal Naval Hospital, Chatham, and was created C.M.G. in 1919. In the following year he was appointed surgeon rear-admiral, in 1922 he was given charge of the Royal Naval Hospital, Plymouth, and in 1923 he succeeded Sir Robert Hill as director-general of the Medical Department of the Navy with the rank of surgeon vice-admiral, retiring in 1927. He received the C.B. (Mil.) in 1923 and was created K.C.B. in 1926, the year after he had been appointed hon. physician to the King. In 1924 he was admitted an Honorary Fellow of the Royal College of Physicians of Ireland and an Honorary M.D. of the University of Dublin. He married in 1908 Irene, daughter of Mr. R. C. Tanner, of Chester.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 14TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2162; diphtheria, 1151; enteric fever, 59; acute pneumonia (primary or influenzal), 342; puerperal fever, 42; puerperal pyrexia, 102; cerebro-spinal fever, 11; acute poliomyelitis, 22; polio-encephalitis, 2; encephalitis lethargica, 3; continued fever, 1 (Leeds); dysentery, 18; ophthalmia neonatorum, 70. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 20th was 2675, which included: Scarlet fever, 838; diphtheria, 960; measles, 35; whooping-cough, 375; puerperal fever, 29 mothers (plus 12 babies); encephalitis lethargica, 271; poliomyelitis, 15. At St. Margaret's Hospital there were 17 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 6 (0) from measles, 2 (0) from scarlet fever, 13 (1) from whooping-cough, 29 (2) from diphtheria, 63 (8) from diarrhœa and enteritis under two years, and 14 (3) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa and enteritis were distributed over 22 great towns, the highest numbers being Liverpool 18, Sunderland and Birmingham each 5, Gateshead 3, no other great town more than 2. Bristol reported 2 deaths from measles. Leeds and Sheffield each reported 2 deaths from whooping-cough. The fatal cases of diphtheria were distributed over 22 great towns, Birmingham reporting 3, Bradford, Hull, Sunderland, and Norwich each 2.

The number of stillbirths notified during the week wa 272 (corresponding to a rate of 42 per 1000 tot births), including 39 in London.

OBITUARY

WILLIAM DUNCAN, O.B.E., M.B. Glasg.

Dr. Duncan, whose death on Sept. 15th was briefly recorded in our last issue, had been for 15 years attached to the insurance medical service and for two years a senior medical officer in the Ministry of Health. He was born at Cumnoch, Ayrshire, in May, 1872, went to school at Ayr Academy, and took his professional training in Glasgow University, where after winning many academic distinctions he took the M.B., C.M. in 1897, being the prizeman in medicine of his year. In the following year he began general practice at Clay Cross, Derbyshire, and soon established a reputation as a clinician of outstanding ability. But the work of his practice, exacting as it was, formed only one outlet for his fund of energy. He threw himself with enthusiasm into the public affairs of the area, becoming medical officer of health for the Clay Cross urban district, certifying factory surgeon, and a member of the Derbyshire County Council. In these capacities he gained experience in the discharge of public duties which stood him in good stead in later years during his career as an officer of the central government. With his colleagues in South Derbyshire he was popular and influential; his counsel was sought and trusted; and he did much to foster a sense of collective professional responsibility. For some years he was secretary of the Chesterfield division of the British Medical Association, which he represented at the annual meetings, and he was one of the original members of the Derbyshire Insurance Committee. In 1912 he was called to the bar at the Middle Temple, winning the J. G. Powell prize in common law. He was keenly interested in the Territorial Force, which he joined in 1907, and when at the outbreak of the war he was mobilised with the 2–6 Sherwood Foresters his career as a general practitioner came to an end. Throughout the war he served with distinction.

[Photograph by Keith Dannatt

DR. WILLIAM DUNCAN

On leaving the army in 1919 Duncan was decorated O.B.E. and was appointed to the medical staff of the Ministry of Pensions as staff deputy commissioner in the London region. His reserve of energy and ability soon made him a marked man. As one of his superior officers remarked: "It doesn't matter how difficult may be the job you give to Duncan, you can depend upon his doing it as well as it can be done." In 1920 he joined the newly constituted regional medical staff of the Ministry of Health, becoming one of the original regional medical officers. It was evident from the first that he was destined for advancement; in 1928 he was promoted to succeed H J. Neilson as divisional medical officer of the estern division, and in 1933 on the retirement of Sir James Smith Whitaker he became the senior medical officer of the Ministry in charge of general practitioner services. He had hardly entered upon his new duties when he was attacked by the illness to which he ultimately succumbed, and during his last two years of life he was seldom free from pain.

Duncan was a man of exceptional energy and driving force. Difficulties had a way of vanishing before his determined attack. If information had to be got he could be relied upon to get it; if an awkward situation had to be adjusted he could adjust it. He was imbued with an idealism which was probably the chief source of his dynamic qualities. Vigorous, always good tempered, in love with his work, touching life at many points, and gifted with an immense capacity for enjoyment, he was a source of inspiration to many. He faced the long tragedy of his last illness with a smiling serenity, a cheerful acquiescence in the premature ending of his career at the zenith of his powers, that recalled his fellow-countryman, R. L. Stevenson, with whom he had not a little in common. His death has deprived the State of an officer of exceptional capacity for public service, and his colleagues past and present of a much valued friend.

Dr. Duncan was twice married, and leaves two grown-up children by his first wife. In August, 1919, he married Christina Smith, who survives him.

JOHN TRIMBLE ELLIOTT, L.R.C.P. Edin.

THE sudden death of Dr. Elliott, of Smithborough, on Sept. 9th, has caused sorrow throughout the medical profession in Co. Monaghan and other parts of Northern Ireland where he was a well-known figure. The eldest son of the late Rev. John Elliott of Armagh, he studied at the Queen's Colleges of Belfast and Galway, where he had a distinguished career, taking his qualifying diplomas at Edinburgh in 1881. After graduation he held for a year the post of resident surgeon to the Derry Infirmary, and was then appointed dispensary medical officer and M.O.H. to the Kilmore district of Co. Monaghan, a post which he still held at the time of his death. His advice in professional matters was sound and freely given; he was on the council of the Irish Medical Association and for nearly half a century acted as secretary to the county medical association. Some years ago he took an active part in ventilating the question of the standard of the dispensary medical officers in the county; these efforts were successful, and in 1930 his colleagues marked their appreciation of his services by an address and presentation. During fifty-three years of practice in the Kilmore district, Dr. Elliott set an example of the best type of family physician of the old school. He had a kindly personality and a rare

DR. ELLIOTT

of homeliness that brought him into close touch th his patients. Though advanced in years at e time of his death, he was engaged in full practice d had lost little of his vigour and intellect. He himself willing to admit that there were many w and strange things in the practice of medicine; his colleagues felt that these were matters of little practical consequence beside his remarkable breadth of judgment and foresight. Dr. Elliott took no part in politics; his interest was in the social life of the people, who honoured him with the same affection and respect as did his medical colleagues.

MEDICAL NEWS

tilisation of the Laboratory in Medicine

A four-weeks' course of 32 lecture-demonstrations will gin on Nov. 4th in the department of pathology of the itish Postgraduate Medical School provided a sufficient mber of students desire to attend. The class will meet om 3 P.M. to 5.30 P.M. every afternoon, with half an ur's interval for tea at 4, and on Saturday mornings om 10 A.M. to 12 noon. The course will exemplify e utilisation of the laboratory in medicine and will nsist of lecture-demonstrations on clinical bacteriology d immunology by Dr. A. A. Miles, hæmatology and inical pathology by Dr. Janet Vaughan, and chemical thology by Mr. Earl King, D.Sc. The detailed syllabus ll be found in our advertisement columns. Application should be made to the dean at the British Postduate Medical School, Ducane-road, Shepherd's sh, W.12.

versity of Durham College of Medicine

The inaugural address of the winter session will be given Sir George Newman on Thursday, Oct. 10th, at .15 P.M.

rmaceutical Society of Great Britain

On Wednesday, Oct. 2nd, at 3 P.M., Sir Gowland opkins, P.R.S., will give the inaugural address of the ety-fourth session of the school, at the house of the ciety, 17, Bloomsbury-square, London, W.C.

oyal Dental Hospital of London

The prize distribution and conversazione will take lace at this hospital on Friday, Oct. 4th, at 8 P.M., when ir Francis Dyke Acland will preside.

oyal Institute of Public Health

The Harben lectures of this institute will be delivered 28, Portland-place, London, W., on Oct. 14th, 15th, and th at 4 P.M. by Dr. P. Armand-Delille, physician to the pital des Enfants Malades, Paris. He has chosen as subject problems of nutrition and growth, and he will eak in English.

ousing Act, 1935

Lord Balfour of Burleigh will preside at a discussion on Act, which will take place at the Royal Sanitary itute, 90, Buckingham Palace-road, London, S.W., Tuesday, Oct. 8th, at 5.30 P.M. Dr. James Fenton, medical officer of health for Kensington, and Mr. J. S. ler, the housing inspector of Kensington, will open discussion.

Paul's Hospital, London

A post-graduate course in urology will be given at this pital (Endell-street, W.C.) on Wednesdays at 4.30 P.M., Oct. 16th to Nov. 27th. Mr. H. P. Winsbury-White give the first lecture on the ætiology of urinary calculus. er lecturers will include Mr. W. K. Irwin, Mr. Claude ls, Mr. Kenneth Walker, Mr. Stanford Cade, Mr. ocelyn Swan, and Dr. H. N. Webber. The titles of the tures, which are open to all medical practitioners, ill be announced week by week in our Medical Diary.

eurological Research in Leningrad

The Leningrad Institute of Post-graduate Medical Studies has founded a department of pathology and hysiology of the higher centres of the nervous system, edicated to Prof. I. P. Pavlov, who presided at the International Physiological Congress recently held in Moscow. The director of studies will be Dr. M. K. Petrova, one of Pavlov's pupils and collaborators. The purpose of the new department is to enable students to study arious forms of artificially conditioned neurosis by nimal experiment, with a view to applying the knowledge ined to the treatment of human patients.

Colonel George Alexander Troup, T.D., M.D., has been appointed a deputy-lieutenant of the County of Essex.

London Hospital Medical College

On Thursday, Oct. 17th, at 4.15 P.M., Prof. William Bulloch, F.R.S., will deliver the Schorstein lecture on Medical Periodical Literature.

An award of the Liddle triennial prize will shortly be made for the best essay on relations of pregnancy to diseases of the kidney, excluding infections of the renal tract. Further particulars will be found in our advertisement columns.

Preventive Aspects of Infectious Disease in Childhood

Dr. Alison Glover will deliver four lectures on this subject on Oct. 1st, 2nd, 3rd, and 4th at 6 P.M. at Gresham College, Basinghall-street, London, E.C.

Welsh National School of Medicine

Sir George Newman will speak on The New Purpose of Medicine when he delivers the inaugural address of the winter session of this school at the Institute of Physiology, Newport-road, Cardiff, on Tuesday, Oct. 8th at 6 P.M.

Central London Throat, Nose and Ear Hospital

On Friday, Oct. 11th, at 4 P.M., Mr. A. Brown Kelly, consulting surgeon for diseases of throat and nose to the Victoria Infirmary, Glasgow, will deliver the annual address at this hospital on The Œsophagus in Young Children: Some Anatomical and Clinical Observations.

Food Poisoning at Swansea

Investigation into the cause of this outbreak is not yet complete, but a bacillus of salmonella strain has been isolated from various sandwiches eaten by the children and from their excreta. All the children affected are making good progress; there have been no deaths.

Marie Curie Hospital

A small reception was held at this hospital on Tuesday, Sept. 17th, to inaugurate the new diagnostic X ray apparatus which was the gift of Miss Edith Stoney in memory of her sister, Dr. Florence Stoney, a pioneer radiologist.

Newquay Hospital

Since this hospital was opened five years ago a new operating theatre has been built and an X ray plant installed. Now a hostel for nurses has been opened and work is to be begun at once on a further extension which will include waiting-rooms, dispensary, and offices.

Sevenoaks Children's Hospital

This hospital for the treatment of hip disease, on behalf of which no special appeal has been issued for many years, now urgently needs £2000. Mr. E. W. Meyerstein has started the subscription list with a gift of £500.

Kettering General Hospital

A sum of £5000 has been offered to this hospital by Mr. Alan Timpson to form the nucleus of a building fund. It is only 13 months since extensions costing £14,000 were opened, but already further improvements, including a new out-patients' department, are urgently needed.

Manchester Royal Infirmary

Plans for the erection of a four-story building to accommodate 100 paying patients have been passed by Manchester corporation town-planning committee. It is anticipated that fees will be from four to ten guineas a week. The cheapest rates will be for rooms containing four beds, and it is anticipated that more than half the beds will be available at a cost not exceeding six guineas a week. The sum of £100,000 has been raised recently for this hospital.

further found that this variation in efficiency is closely correlated to the concentration of sugar in the blood when this is estimated at regular intervals in such workers, and that it is still more closely correlated with the changes in the respiratory quotient during the same time. When these variations are more closely examined it is found that the efficiency, the respiratory quotient, and the blood-sugar are all at their lowest either in the early morning hours when work is being done after a meagre breakfast, or at periods so long after the mid-day meal that the minor features of hunger are beginning to make their appearance. By increasing the number of meals from three to five, without making any increase in the total amount of food ingested, they were able to increase the physical efficiency of factory workers by a very definite amount as gauged by output. The two additional meals were given in the middle of the morning and the middle of the afternoon, and consisted of milk and cake, it being found that carbohydrate food, as the observations on the respiratory quotient and blood-sugar suggest, was essentially the factor necessary to improve physical efficiency.

What general conclusion is to be drawn from this work? If the reader is the owner of a factory devoted to the mass production of tennis shoes the answer is perhaps easy, but if he follows a different calling it becomes very much more difficult. Perhaps an answer may be supplied by the first and last pages of Haggard and Greenberg's book. On the first page it is written—" breakfast is now generally a light meal; but it is so largely because an elaborate breakfast requires that someone should get up early to prepare it, and service in America now is at a minimum. Again, in most American households, the evening dinner is eaten fairly early; otherwise someone would have to work late to wash dishes." On one of the last pages we read, as to the habits of the subjects under investigation; " all were ignorant of the requirements of nutrition; all ate what appetite or momentary availability dictated. We found one woman who subsisted almost entirely upon cheese sandwiches and candy, another whose diet was at least two-thirds ice-cream sodas, and still another who ate little but bread and jam and coffee."

Perhaps these quotations justify the heading of this article. It is clear that if these American work-people were given a slice of cake and a glass of milk in the middle of the morning and the middle of the afternoon they would produce more tennis shoes, and physicians versed in the difficulties of treating cases of peptic ulcer will immediately recognise that the suggested change of diet would be an immense benefit to any workpeople having a tendency to this disease; but does the community require more tennis shoes, should the healthy man's diet be on the same lines as that of one convalescent from duodenal ulceration, and is mankind happier when housekeeping and domestic life are reduced to the barest possible minimum?

The wild animal, human or other, tends to hunt for long hours or days, and when he has killed his food will eat to repletion and then indulge in a long sleep; whether or not this is a physiological ideal it must surely be remembered when the advisability of a diet of snacks is under consideration. One of the reasons why Amundsen returned from the South Pole when Scott and his companions did not was that the former with his men adopted the wise plan of marching each day until they were tired, and eating at the dictates of hunger, without guidance in either case by the clock. It is no detraction from the merits of the book of Haggard and Greenberg to say that such things must be thought of when drawing conclusions from their work.

Lancashire mental hospitals board is negotiating urchase of about 600 acres of land on the Lathom ate, near Ormskirk, where it is proposed to o new mental hospitals at a cost of about 000.

THE INDIAN FIRE-WALK

A FIRE-WALK demonstration by Kuda Bax c by Mr. Harry Price, the honorary secretary of University of London Council for Psychical Investigation, took place last week in the grounds of a house at Carshalton through the courtesy of Mr. Alex L. Dribbel. Two trenches about 11 ft. long, 6 ft. wide, and 9 in. deep had been dug in which had been kindled a charcoal fire. Seven tons of oak logs, one ton of fire-wood, ten gallons of paraffin, and fifty newspapers were used in preparing the fire. On the top was spread half a ton of forest-burnt oak charcoal. The fire was ignited at 8 A.M. in the morning of Sept. 17th. The walk took place between 3 and 4 P.M. on the same day when intense heat was being given out from the fire. We are indebted to Prof. C. A. Pannett, F.R.C.S., for the following account of the proceedings:

Kuda Bax is the physically slight Indian type. He *claims that his immunity from burning is due to an act of faith, to the influence of his mind over his bodily reactions.* He is temperamental and took a dislike to one pit over which he could not be induced to walk, saying that he felt there was something wrong and unfavourable about it. The explanation of this attitude was perhaps revealed later; he had twice successfully walked over the one pit and had twice walked to the brink of it again to make a third attempt when his courage failed him. He said something had gone out from him and that the physicist who had taken the temperature of the glowing charcoal had desecrated the pit. He did not actually use that word, but said his was a religious act of faith and that it had been rendered impossible by the thrusting of the instrument (a thermocouple) into the burning embers. Up to this time the physicist had occupied himself with the pit from which Kuda Bax had already shown an aversion. When the thermocouple was placed in the fire it registered temperature of 800° C., but when it merely made rapid contacts in imitation of footsteps it only registered, I believe, the temperature of rather warm water. On the other hand two English volunteers certainly blistered their feet in making attempts at the walk.

There appeared to be nothing abnormal about the soles of Kuda Bax's feet. The skin was soft and not at all callosed. It seemed to be very dry, much drier than the feet of the two Englishmen who made attempts to walk on the glowing embers. A skin thermometer showed the temperature of his feet to be 93·2° F. After this they were washed and dried. After an interval of about 20 minutes, during which Kuda Bax loitered about the lawn, he walked the length of the pit which took, I think, four steps. He walked lightly but not with undue haste. He did it twice. Almost immediately after the second attempt (10 seconds perhaps having elapsed) the temperature of the soles of his feet was again taken and found to be 93° F. On inspection no sign burning of the skin could be made out unless it was that certain areas appeared a little whitened, resembling somewhat epidermis which has been sc but not enough to cause blistering. The pigmentation and texture of the skin of the however, made it difficult to be sure even of There was no sign of blistering nor any hype nor did there seem to be any discomfort.

One of the Englishmen, Mr. Digby Moynagh, made an attempt had tried to do the same thing days before. The soles of his feet had nume healing blisters on them. He acquired some at the second attempt. His skin was moister the Indian's and this may have had some influ because afterwards a small piece of charcoal was f stuck to the skin, and on its removal a blister found underneath. It is possible that moisture the charcoal adhere and perhaps prolonged period of contact. The other Englishman, urice Cheepen, who tried the walk was also bli

Dr. Robert Field Library
S. M. S. Medical College

Before Kuda Bax made his attempt, a piece of inc oxide plaster, ⅝ in. square, was stuck to the rch of the sole of his right foot. t the end of the emonstration this piece of plaster showed no signs f burning, except that the fluff from the cotton bric at the cut edge exhibited a very slight amount f scorching. The surface of the ignited charcoal was irregular that contact must have been made with ll parts of the sole.

No other facts were observed.

BIOLOGY AND HUMAN TRENDS

In an article with this title reprinted from the *ournal* of the Washington Academy of Sciences une 15th, 1935) Prof. Raymond Pearl contends that an is "enjoying better health, and individually ives longer than ever before." Of the truth the latter statement there is no doubt, but some ay question the truth of the former.

Prof. Pearl writes enthusiastically of the achieve- ents of medical science. "The last seventy-five ears," he says, "have witnessed more progress in nowledge of disease and its effective treatment and revention than was made in all the time that went fore," and he anticipates that even greater triumphs re in store for us. In regard to unemployment, he fers to the fact that new inventions and increased ansport facilities have enabled a portion only of the rld's population to produce all the essential forms wealth (and more) and to carry on all the business the world, leaving a considerable number of employed, for whom no work can be found. Some these are unemployable by reason of mental or ysical unfitness. "These," he remarks, "are t alive by the rest of society for no realistically onstrable reason other than that they were once ." As to the fit unemployed the author believes t means will be found to reduce their number, ably by the adoption of contraception which with some justice" has been regarded as "the t important biological discovery ever made." does not accept the opinion, generally held, that differential increase of fertility among the least ble members of the community, brought about contraceptive measures, is leading to serious rioration of the race.

The author is a staunch upholder of eugenics; reminds us that at every stage of man's history, before the time of Plato, men have lamented the fference displayed to eugenic ideals. And he etells a distant future when the facilities for easy speedy transport to all parts of the world will to an interbreeding and blending of different es. "In the far off end all mankind will presum- be a rather uniform lot; all looking, thinking, acting pretty much the same way, like sheep" consummation not, one would think, devoutly be wished.

ARGUMENT ABOUT STERILISATION

THREE small books on sterilisation[1] approach subject from widely different points of view. Whitney is the director of the American Eugenics ty, and his book is written in a frankly propa- ist spirit for the interested but ignorant layman. style is conversational and, at times, racy; the es he advocates closely resemble those which favour in this country, except that he wishes to voluntary sterilisation available for habitual nals. The effect of the book is unfortunately by the footnotes of an editor who never s the reader to overlook the occasions upon he differs from the author, and the impression created of a divided opinion upon a controversial
subject is disturbing.
on occasion of question
(p. 143). The appendi
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Dr. Helen Macm
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HEALING RITUAL IN S

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he does what he does. But if
appreciate what strange procedur
medical and surgical practice, and
constitute it in our own country ad
mine of information in a book by will and a
about what goes on in Serbia and th . P. Kemp[1] parts about it. Among what seems to be a mass of nonsense there are no doubt useful procedures and, it may be, something that might well be extracted for more general use. But the narrative in general is of more anthropological than medical interest.

DRUGS AND DOSES

Craig's "Posological Tables" (Edinburgh: E. and S. Livingstone, 2*s*.) and Morton's "Principal Drugs and Their Uses" (London: Faber and Faber Ltd., 2*s*. 6*d*.) have been revised and brought up to date. Craig, which enters on its sixth edition, gives the imperial and metric doses of all official drugs and preparations and many important unofficial ones, together with notes on their action and uses and form of administration. The list is not quite complete. Under tannic acid no mention is made of the use of a solution in the treatment of burns: calamine is stated to be used as an ointment without any indica- tion of its widespread use as a lotion; synonyms of British products—Neokharsivan, Novostab, and

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[1] The Case for Sterilisation. By Leon F. Whitney. With roduction and notes by Norman Haire, Ch.M., M.B.
: Lane, The Bodley Head. 1935. Pp. 215. 8*s*. 6*d*.
ilisation? Birth Control? A book for family welfare
ety. By Helen Macmurchy, C.B.E., M.D. Toronto:
an Company of Canada Limited. Pp. 156. 7*s*.
sation: A Christian Approach. By the Rev. J. P.
B.A., and Josephine E. Calcutt, M.A. London:
and Unwin L 1935. Pp. 196. 5*s*.

[1] Healing Ritual: Studies in the Technique and Tradition of the Southern Slavs. By P. Kemp. (Published in conjunction with the School of Slavonic and East European Societies, University of London.) London: Faber and Faber Ltd. 1935. Pp. 335. 21*s*.

further found that th'; variaided with Neosalvarsan
closely correlated to the concmine; and the nature
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in such workers, and that idministered in solution
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their appearance. By increasing thster tutor and is
meals from three to five, without makin more important
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The two additional meals were given ings, and many
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consisted of milk and cake, it beinto know that
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tory quotient and blood-sugar suggest? Stovaine is
the factor necessary to improve physiocaine." Parts 1
What general conclusion is to be e been included,
work? If the reader is the owneapplying the term
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answer is perhaps easy, but if he gerous Drugs Acts.
calling it becomes very much more in future editions.
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breakfast requires that someone **LA**
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minimum. Again, in most Ach symbols of playful
the evening dinner is eaten faiskins of an animated
someone would have to work ose may not commend
On one of the last pages we seek diversion in their
of the subjects und in or such cartoons suggests,
of the requiremengienic or any other sort of instruction
tite or momentaacross effectively by their agency,
one woman who lessons to be taught are well defined,
sandwiches and oncrete. The entertaining ten-minute
least two-thirds Grosvenor House, Park-lane, W., on
who ate little butld have been more cogent as pro-
mistakes of the victims of the Bad
Perhaps these well as the modern health weapons
this article. It iscovery was supposed to be promoted
people were givenearly defined. *But the object of the*
in the middle of t film, to show that when there is
afternoon they wo usefully be said to the public on
and physicians vere cartoon can be made an effective
ways of peptic was amply achieved. The film is
called See sted They Won. It was produced by
Celebrity Productions, and presented in colour by
Revelation Films Ltd., under the auspices of Messrs.
Boots Ltd., who entertained some 60 guests at
lunch before the show. We learn that 200 picture
houses have already booked the cartoon for exhibition.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Oct. 1st.

Orthopædics. 5.30 P.M. (Cases at 4.30 P.M.), Mr. C. Max Page: The Development of Orthopædic Surgery (Presidential Address).

WEDNESDAY.

History of Medicine. 5 P.M., Dr. E. W. Goodall: Epidemiology and Some Epidemiologists (Presidential Address).

[illegible]SDAY.

[illegible]ropical *Disease and Parasitology.* 8.15 P.M., Prof. [illegible]. Hörlein [illegible]: The Chemo-[illegible]herapy of [illegible] Disease (with [illegible]ecial reference to *Acaprin*, a new compound in [illegible]iroplasmosis, and *Prontosil*, a new azo dyestuff in [illegible]treptococcal infections).

WEST LONDON MEDICO-CHIRURGICAL SOCIE

FRIDAY, Oct. 4th.—8.30 P.M. (West London [illegible] Dr. Bernard Myers: Clinical Reminiscenc[illegible] dential Address).

LECTURES, ADDRESSES, DEMONSTRATIONS

FELLOWSHIP OF MEDICINE AND POST-GRA MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 30th, to SATURDAY, Oct. 5th.—ST HOSPITAL, Leicester-square, W.C. Course in tology (afternoons and evenings).—GORDON H Vauxhall Bridge-road, S.W. All-day co Proctology.—MEDICAL SOCIETY OF LOND Chandos-street, W. Mon., Tues., Wed., 5 P.M., course in X ray interpretation.—PARK H Hither Green, S.E. Week-end course on Courses arranged by the Fellowship are op to members.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.

THURSDAY, Oct. 3rd.—9 P.M., Dr. J. L. Livi Diagnosis of Early Tuberculosis.

SATURDAY.—11 A.M., Dr. Livingstone: Blood and its Therapeutics. 11.30 A.M., Dr. Clay Dr. Cooksey: [illegible] issage, Exercises, and [illegible] 2 P. Firth: Simple G[illegible] their Tr 2.30 P.M., Demonstration of Clinical Cases. Dr. McCance: Tetany—Film Demonstration. Mr. Buxton, Dr. R. Lee, and Mr. Palmer: Th and Treatment of Backache.

SUNDAY.—10.30 A.M., Dr. [illegible] Newman: New Dr Therapeutic Remedies. 11.15 A.M., Mr. On Induction of Labour. Noon, Mr. E Ulcers of the Mouth. (These lectures are op medical practitioners.)

CHARING CROSS HOSPITAL, W.C.

SATURDAY, Oct. 5th.—10 A.M., Dr. H. A. Dunlop a[illegible] a Neurological Symptom and its Tre 11 A.M., Dr. J. E. M. Wigley: Eruptions on th and Feet. Noon, Dr. C. J. Hamilton Abdomen in Children. 2 P.M., Dr. Gordon Demonstration of Cases. 3 P.M., Mr. R. A. Fitz Cholecystitis. 4 P.M., Mr. [illegible] Hine: General Practice.

SUNDAY.—10 A.M., Mr. E. D. D. [illegible]is: Laryn Tracheal Obstructions. 11 A.M., Mr. C. Marshall: The Chronic Abdominal Invalid. Mr. Norman Lake: Hallux Valgus. 2 P. S. Cochran[illegible] Investig the Stomac[illegible] M., Mr. A. MacLeod: [illegible] 4 P.M., D Plummer: [illegible] to former of the hospital.)

MIDDLESEX HOSPITAL, W.

MONDAY, Sept. 30th.—10.15 A.M., Mr. F. J. Cl Clinical Demonstration of Hearing Aids. 11 Prof. Samson Wright: Recent Applied Ph 12.15 P.M., Mr. W. Sampson Handley: Th Diagnosis of Acute Appendicitis. 2 P.M., D Lakin: Difficulties in Diagnosis. 3 P.M., D Graham-Hodgson: New X Ray Diagnosis Dem

TUESDAY.—10.15 A.M., Mr. Philip Wiles: Man Methods in Practice. 11.15 A.M., Mr. G. Taylor: The Attitude of Surgery Towards omesis. 12.15 P.M., Mr. E. Pearce Gould: My in Minor Surgery. 2 P.M., Dr. [illegible]zod Bennett: stration of Medical Cases. 3 P.M., Mr. Victor, Talk on Gynæcology and Obstetrics. (Open former students of the hospital.)

HOSPITAL FOR SICK CHILDREN, Great Ormond W.C.

THURSDAY, Oct. 3rd.—2 P.M., Dr. A. Signy: Pat Demonstration.

Out-patient clinics daily at 10 A.M., and ward visit on Wednesday) at 2 P.M.

LONDON SCHOOL OF DERMATOLOGY, 49, [illegible] square, W.C.

TUESDAY, Oct. 1st.—5 P.M., Dr. A. C. Roxburgh:

THURSDAY.—5 P.M., Dr. G. B. Dowling: Seborr Seborrhœic Derm[illegible]

LLO[illegible] P.M. (1, Wimpole-street, [illegible] General Ideas in Medicine

PUBLIC DISPENSARY AND HOSPITAL, Leeds.

WEDNESDAY, Oct. 2nd.—4 P.M., Dr. J. G. Ga S. J. Hartfall, and Mr. L. N. Pyrah: Thyro

ROYAL INFIRMARY, Manchester.

TUESDAY, Oct. 1st.—4.15 P.M., Mr. F. G. Wrig Change from the Acute Middle Ear to Mastoid.

FRIDAY.—4.15 P.M., Dr. P. B. Mumford: Some of Common Skin Diseases, with Discussion of ment.

HUDDERSFIELD ROYAL INFIRMARY.—The patients' department of this hospital has been opened. It contains 12 single-bedded rooms, rooms each containing two beds; [illegible] are five week in a single-bedded room [illegible] four guin double-bedded one. The medical and surgical f no case to exceed 15 guineas for [illegible] admission.

that painting the patches daily with a 1 per cent. solution of iodine in spirit, followed by the application of an ichthyol cream or paste is effective. Alkaline soaps should not be used for washing the face.

ECTHYMA

This is merely a deep form of impetigo in which destruction of the epidermis occurs and an ulcer results; consequently the lesions leave scars after healing. They occur usually on the legs, and circulatory stasis is an important contributory factor, so that they are common in persons with acro-asphyxia, and on varicose legs, where they may be the starting point of chronic varicose ulcers. During the war ecthyma was a very frequent complication of pediculosis, and the *Streptococcus fæcalis* was often the infecting organism (H. MacCormac). The lesions will usually heal under antiseptic applications—e.g., a 1 in 4000 solution of perchloride of mercury applied as compresses after removal of the crusts. In obstinate cases, where as a rule the patient is debilitated, exposure to sunlight or the ultra-violet rays is of value.

INTERTRIGO AND STREPTOCOCCAL FISSURE

With the relapsing lymphangitis to which they predispose, these are the commonest chronic conditions caused by streptococcal infection of the skin. They may, indeed, be regarded as the cutaneous manifestations of chronic streptococcal infection of epithelial structures, which is one of the most difficult of all diseases to cure. As an example, the following case, already described by me in the Guy's Hospital Reports, 1931, lxxxi., 92, may be quoted :—

A lady, aged 28, had scarlet fever at the age of twelve, and from that time had suffered more or less continuously from so-called "eczema" of the ears. She has had five attacks of erysipelas of the face. Before her marriage there was some leucorrhœa, and, since the birth of one of her two children, there has been a thick vaginal discharge. Unless this is checked with a cotton-wool plug she develops "eczema" of her groins. She has also periodically had the "eczema" in the submammary folds. On examination she was found to have (1) typical retro-auricular intertrigo, obviously of streptococcal origin, with chronic meatitis; (2) at the upper angles of the nostrils were the remains of streptococcal fissures, doubtless the portals of entry of infection responsible for her attacks of recurrent erysipelas. The "eczema" of her groins and submammary regions to which she was subject were clearly also streptococcal intertrigo. The vaginal discharge was found by Mr. F. Cook to be due to a chronic cervical erosion. Prof. Eyre recovered a *Streptococcus pyogenes longus* with other organisms from the retro-auricular intertrigo and the nasal fissures.

This case illustrates very well the persistence over a period of sixteen years of a streptococcal infection of the skin dating from an attack of scarlet fever. The patient was very lucky in that her repeated attacks of erysipelas, arising from neglected nasal fissures, did not lead to permanent blockage of the lymphatics of the malar regions and eyelids. The patient's sister was also under my care for chronic retro-auricular intertrigo.

The prognosis as regards cutaneous lesions in chronic streptococcal infection is more favourable than where the mucous membranes are involved, but even so relapse is common, particularly in those who are compelled to live sedentary indoor lives. As has already been indicated, I believe that diet and environment are important factors, and I am convinced of the value of vaccine therapy, if it is employed judiciously and for a sufficient length of time. An important point is that the local treatment of intertrigo and fissure must be continued until a normal epithelium has been re-established, for otherwise relapse is certain.

ACUTE ERYSIPELAS

Severe cases of erysipelas, ending sometimes fatally, are less common than formerly, and I do not think that this is entirely due to more effective treatment. Possibly the diminution of chronic alcoholism may be partly responsible. A. Rendle Short (Index of Prognosis, 1915) states that the mortality in 875 cases at St. Bartholomew's Hospital, collected several years ago, was 3·5 per cent. In cases in which there was an accompanying cellulitis it was much higher—11 per cent. in 889 cases. W. H. Guy (Jour. Cut. Dis., 1919, xxxvii., 399), D. Symmers and K. M. Lewis (Jour. Amer. Med. Assoc., 1927, lxxxix., 880) and others have emphasised the therapeutic value of streptococcal antitoxin. H. Semon has recorded the remarkable effect of intramuscular injections of aolan in a case in which a fatal result had been anticipated, and in recent years I have employed this method of treatment in several cases of varying severity with uniformly good results. In the absence of unfavourable conditions, such as alcoholism, diabetes, chronic renal disease, long-standing malnutrition, and cachexia, the prognosis in acute erysipelas may be regarded as very favourable.

RECURRENT STREPTOCOCCAL LYMPHANGITIS (RELAPSING ERYSIPELAS)

This is one of the most important and serious complications of chronic streptococcal infection of the skin, because the repeated invasion of the lymphatics may eventually cause their blockage, giving rise to persistent elephantiasis and consequent disfigurement. The streptococcal fissure is the usual portal of entry to the lymphatics. When these occur between the toes, they are usually secondary to epidermophytosis. They may cause recurrent attacks of lymphangitis of the feet, ankles, and legs, the origin of which is often overlooked. I have recently seen two cases in which permanent blockage of the lymphatics with the production of elephantiasis had occurred from this cause, and in both the interdigital fissures and mycotic infection had been disregarded. The importance of thorough treatment of interdigital epidermophytosis is thus manifest, since it may in this way be indirectly responsible for permanent, though partial, disablement.

Recurrent lymphangitis, however, most frequently occurs on the face, giving rise all too often to persistent elephantiasis ("solid œdema" of Hutchinson). This condition has long been recognised under various terms—e.g., erysipelas perstans faciei (Kaposi), erythema perstans faciei (Kreibich), lymphangitis faciei (Mackenzie). The parts affected are usually the malar regions and the eyelids, and exposure to cold is certainly a factor predisposing to the attacks. In the great majority, if not in all cases, the portals of entry for infection of the facial lymphatics in this area are fissures at the angles of the nostrils. I am aware that cases have been recorded in which it was stated that no such fissures were apparent, but I believe that a careful examination with a strong light of the nasal vestibules at the time of the attacks will almost invariably reveal them, and, as a rule, they are seen even in the intervals. They are often associated with impetiginous anterior rhinitis, chronic nasal and nasopharyngeal catarrh, and sometimes with sinusitis. Their treatment is of paramount importance, since a repetition of the attacks of lymphangitis will in time inevitably lead to lymphatic blockage and permanent disfigurement. Less commonly, relapsing erysipelas involves the ear, neck, and side of the face, and is then due to chronic or recurrent fissures below the lobe of the ear, or in the retro-auricular space. Involvement of the lips may occur from chronic fissures at the labial commissures (*perlèche*), or in the centres of the vermilion borders.

The prognosis is in these cases good, providing that persistent blockage of the lymphatics has not already occurred. Thorough treatment of the fissures with a silver nitrate paint and a mercurial ointment or paste should be carried out until a normal epidermis has re-formed. In obstinate cases a few fractional doses of X rays are sometimes helpful. Even when blockage has not yet occurred, local treatment may well be combined with injections of an autogenous or a mixed stock streptococcal vaccine, which in my opinion give better results if made intradermally. In my experience these cases are extremely sensitive to the vaccine, and even very small doses are likely to produce a local necrosis at the site of the intradermal injections and a flare up of the lymphangitis.

When persistent lymphatic œdema is already established the prognosis is much less favourable. In some cases, however, I have had good results with intradermal injections of streptococcal vaccine, given over a long period in gradually increasing doses. In America injections of *Streptococcus erysipelatis* toxin have been favourably reported upon in these cases, and G. C. Andrews (Diseases of the Skin, Philadelphia, 1930) states that they are "a specific method for the prevention of recurrences and the reduction of persistent lymphœdema in cases of chronic recurrent erysipelas."

H. W. BARBER, M.B., F.R.C.P.,
Physician for Diseases of the Skin, Guy's Hospital.

SPECIAL ARTICLES

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

THE twenty-first annual conference of this association was held at Southport from June 27th to 29th, under the chairmanship of Sir ROBERT PHILIP, the general subject for discussion being the

Responsibility of the Nation towards the Child in Respect of Tuberculosis

Dr. G. LISSANT COX (Lancashire) said it might readily be supposed that the sub-standard child, as compared with the normal child, was more likely to be infected by, and die of, tuberculosis either as a child or later as an adult. This did not appear to be so, as a special survey made in Lancashire had shown. But since infection might lead to disease, it was of the greatest importance to safeguard the child. It was known that under certain conditions there was a very high non-pulmonary tuberculosis death-rate in young children subject to infection from mother or father. Further, in an investigation into "contacts," it had been shown that at least 15 per cent. of known cases of pulmonary tuberculosis gave rise to secondary cases, in spite of modern antituberculosis measures, the average interval between the discovery of primary and secondary cases being 3½ years. The three factors on which methods of prevention were based were isolation, immunisation, and environment. In Lancashire they had taken as their basic principle the words: find, isolate, educate, and treat the *adult positive case.* They had always concentrated on the adult positive case, believing that this safeguarded the child. Dr. Cox briefly described the various methods of isolation—the Grancher system, hospital or sanatorium isolation, or village settlements for the whole family. With regard to the provision of hospital isolation, the number of beds which should be available throughout the country was one for every death from tuberculosis. At present only a very small minority of tuberculosis workers in this country advocated inoculations for immunisation, and the speaker thought that the present state of knowledge did not warrant a large or routine use of this method of safeguarding children against infection. The principle of environment was at least as important as that of isolation. It had been shown conclusively that a higher standard of living and of housing was a direct safeguard against infection, and to this factor was largely due the great diminution which had already occurred in the incidence and mortality of tuberculosis.

Dr. M. SKOKOWSKA-RUDOLF (Warsaw) pointed out that the two peaks of tuberculosis mortality in childhood were in the first year of life (decreasing during the 3–7-year period), and in adolescence. Preventive efforts should be directed chiefly towards these two periods. Poland had adopted Calmette's system of B C G vaccination, while among other suggested provisions for the protection of tuberculous children and those in danger of infection were the following: (1) to instal for every 100,000 of the population three pairs of beds for expectant mothers (suffering from tuberculosis) and their infants, in order to allow of proper B C G vaccination and instruction of the mothers in nursing their babies; (2) to instal 12 beds for every 100,000 of the population for inoculated children; (3) to provide a minimum of 5 hospital beds for tuberculous children of pre-school age (3–7 years) for every 100,000 of the population; (4) to provide 10 sanatorium beds for every 100,000 of the population; (5) to create forest school preventoriums for children of school age, taking as standard 40 beds for every 100,000 of the population; and (6) to instal as auxiliary establishments "half sanatoria" (day and night sanatoria). These institutions were already doing good service in the big cities of Poland, children from tuberculous families spending the greater part of the day in them.

BOVINE TUBERCULOSIS

Major A. B. MATTINSON, F.R.C.V.S., spoke particularly on infection through the milk-supply. Assuming as approximately accurate the statements that any cow giving tuberculous milk to-day would be dead within a year, that any cow affected with tuberculosis to-day would be dead in five years, and that almost every cow which would be giving milk in 1940 was either unborn or was at present free from tuberculosis, certain lines of progress were indicated, including an overhaul or at least a tightening up of the various Acts and Orders. Major Mattinson outlined many ways in which the incidence of clinical bovine tuberculosis might be brought under control, urging adequate veterinary supervision of dairy herds with the object of reducing clinical—and not merely mammary—tuberculosis at its earliest manifestation.

Dr. NATHAN RAW (London) said that while no animal could be given an immunity to a lethal dose of virulent bacilli, it could be given an immunity sufficient to resist a mild form of infection, which was the usual method by which the animal was attacked. The immunisation of calves was simple, the method Dr. Raw adopted being the injection of cultures of human bacilli which were non-pathogenic and avirulent. The vaccine was injected when the calf was a week old, and again at the end of two weeks, and very satisfactory results had been obtained.

Dr. R. VEITCH CLARK (Manchester) said that the elimination of bovine tuberculous infection was merely a question of money and work, and neither of these was beyond the capacities of this nation. At present there were about 2000 deaths each year from this cause in England and Wales, and three-fifths of them were in persons under fifteen years of age. Tuberculous infection of cattle varied in incidence, but on the average 6 per cent. of the milk in England and Wales was infected. In Manchester during the past thirty-four years the average was 11 per cent., and during the past five years it had varied between 11 to 16. For years the country had submitted to the sale of a food known to be producing an enormous bulk of disease, and it was time that active steps were taken against the continued menace. Of the graded varieties pasteurised milk was the only one which from the point of view of protection against tuberculosis had given good results both in quality and in quantity. This form of milk-supply was the only protection at present available to the public against the conveyance of tuberculosis; it removed this source of infection and afforded a degree of protection which would almost entirely eliminate the disease. It was significant, Dr. Veitch Clark added, that the Ministry of Agriculture in its scheme for the registration of tubercle-free herds required that no calf should be fed except with milk from a tubercle-free cow or with milk which had been pasteurised or sterilised. If this was necessary for calves, surely it was infinitely more necessary for children.

Dr. M. CHRISTIANSEN (Copenhagen) said that Denmark had been the first country to organise a rational eradication of tuberculosis in cattle. As early as 1892 Prof. Bernhard Bang set out his method for combating this disease, since which time it had been adopted with or without modification in many other countries. As a result of it tuberculosis in cattle had now been eradicated completely on several Danish islands, the herds comprising a total of about 75,000 cows. Complete eradication of cattle tuberculosis had also been accomplished in several dairy districts of the larger islands. A sanitary regulation laid down that from the year 1938, at latest, all milk distributed in Copenhagen must come from healthy tuberculin-tested stocks, and several other provincial towns in Denmark had already carried through a similar ordinance concerning the milk distributed for sale.

B C G VACCINATION

Dr. E. RIST (Paris), after describing the experiments carried out by Calmette and Guérin which culminated in the strain of tubercle bacillus known as B C G, said that there was now practical unanimity of opinion as to the harmlessness of B C G administration to infants. The special expert committee appointed by the Public Health Committee of the League of Nations to examine the possibility of spontaneous variations of B C G resulting in its transformation into a virulent strain, unanimously concluded that this had never occurred experimentally, nor had a single instance of its spontaneous occurrence ever been reported. The essential question, however, was whether B C G really did protect the child against virulent infection. Objections, for the most part justified, had been raised against Calmette's first statistics; but later work, notably that of Arvid Wallgren, of Göteborg, Sweden, showed very conclusively that B C G vaccination was really able to protect previously uninfected children against virulent infection. The immunity conferred, however, was probably neither absolute nor lasting, and therefore it was important that the children should be exposed to virulent infection when the vaccinal immunity was at its height. The result of this would be to transform the relative and short-lived artificial immunity produced by vaccination into a stronger and more lasting natural immunity. Calmette and Guérin's discovery must be regarded as the first successful attempt at specific prevention of tuberculous infection in human beings.

Dr. K. NEVILLE IRVINE (London) said that, apart from the Lübeck disaster, of the fatal cases which had been reported—about 30 in number—none had been proved beyond reasonable doubt to be due to the vaccine. As to the effectiveness of B C G, only two out of more than a hundred reports from clinics all over the world found it to be inactive; all the remainder showed varying degrees of protection. While B C G was not perfect, it was worth considering that the vaccine had been proved safe for a million and a half children, that it reduced the morbidity-rate from tuberculosis in children by at least half; that already it was being used in nearly every European country except Great Britain; that it was safe in even inexperienced hands; and that it was not costly.

Sir ROBERT PHILIP, the chairman, said it would be a mistake to suppose that no work at all on B C G had been done in this country; a great many observations had in fact been carried out behind the scenes. It was clear that the vaccine was efficacious to a considerable degree, but it had not yet been settled how far the effect was permanent.

EARLY EVIDENCE OF DISEASE

Dr. CHARLES CAMERON (East Lothian) said that although infection and disease were not synonymous, yet infection must precede tuberculous disease. The day might come when the use of the various cleavage products of tuberculin would make it possible to discriminate between harmless infection and active disease, but in the meantime fuller use must be made of the information provided by the tuberculin test. The test should never be omitted in the elucidation of obscure symptoms in childhood, and a positive tuberculin reaction was a signal for the use of measures for raising the child's natural resistance, including the therapeutic use of tuberculin.

Dr. N. TATTERSALL (Leeds) said he did not look on a positive skin test as an indication for treatment. The question was: Were there any steps to be taken or tests to be applied to discover which infected child was in danger from his infection? In many cases this was not possible; seed time and harvest lay too far apart—perhaps twenty, thirty, or forty years. But he thought there was a not inconsiderable number of children in whom could be recognised a stage of infection, the unstable or significant lesion, which was an imminent danger to them, particularly in adolescence. A much wider application of X rays would bring to light far more of these unsuspected cases than was at present realised. Dr. Tattersall suggested that the time had come when every child should have a tuberculin test on entering and on leaving school life, and once in the middle years, and that every child—not the positive reactors only—should be radiographed at the same three periods. Close coöperation between the tuberculosis dispensary and the school authorities would be essential. Among other measures for detecting early infection might be a wider use of the sedimentation and other blood tests. An application of these methods to children might help to show the dividing line between infection and disease in childhood, without which a knowledge of "infection" only was of comparatively little practical value.

Dr. L. S. T. **Burrell** (London) pointed out the necessity for finding terms to distinguish between persons infected with tuberculosis with and those without clinical disease. The term "pre-tuberculous" was a bad one, but if used at all, it should be applied only to those with a negative tuberculin test. Those with a positive test were already infected, and in such persons certain signs or symptoms might develop which experience showed would render the individual liable to become consumptive, even when clinical and radiological examination revealed no active disease. The importance of examining children was chiefly to detect this stage of latent tuberculosis. It was a matter of the greatest difficulty to determine whether or not a child had a lesion which might develop into active disease, and which therefore needed treatment. The child might be in danger either because it already had some lesion, or because it was in contact with infection. Examination should therefore have the double object of discovering any lesion present and of determining whether the child was in sufficiently close contact with infection to render it liable to develop tuberculosis. The second of these objects was by far the more important since it aimed at prevention rather than cure. It was not only easy to overlook a tuberculous lesion which was present, but it was even more easy to imagine one when the child was weakly or undernourished. Weakly children did need treatment, and since to treat them in a sanatorium or preventorium was as good as any other method, it mattered little whether or not their disability was due to tuberculosis or not. What did matter was that the strong children should not be neglected, because they were equally susceptible to tuberculosis. Adults rather than children should be examined in an infected household, to discover a possible source of infection; and any child, robust or delicate, was in grave danger of being infected or reinfected if he remained in contact with a case of open tuberculosis.

Dr. H. **Midgley Turner** (Sheffield) said that children who attended for periodic examination at a tuberculosis dispensary could be divided broadly into three classes: (1) notified cases of tuberculosis; (2) infected children without symptoms or signs of active disease, who were still exposed to known sources of infection; (3) children not yet infected, but exposed to a known source of infection. The purpose of examination in the first group was to assess the general health, to ascertain that there was no evidence of toxic absorption, to examine carefully for any change in the local signs of disease in the system known to be infected, and to note whether spread to other lymphatic systems had occurred. In the second group the object was to seek any subjective or objective evidence that the child was being adversely affected by the tuberculous infection, and, if so, to localise and treat the lesion. In group 3, examination was directed towards observing the reactions of the child when infection occurred, and taking steps where necessary to begin treatment. The aim, therefore, of systematic examination of children was to detect the earliest evidence of clinical disease, remembering that the examination must be concentrated mainly on the child's lymphatic system. Sputum-positive pulmonary tuberculosis in the child was relatively uncommon.

OPEN-AIR SCHOOLS

Dr. C. J. **Thomas** and Dr. **Noel Bardswell** (London County Council) described the growth of the open-air movement in schools in London, and the remarkable improvement, physical and mental, in the children attending such schools. Two principles of exceptional importance in this work were, first, the necessity for constant vigilance to see that in all ways complete sanatorium conditions were preserved, and insidious attempts to introduce heating firmly resisted; and, secondly, the necessity for an ample supply of good nourishing food.

Dr. **Ralph Williams** (Board of Education) said that the day and residential open-air school had definite places in the prevention of tuberculosis, providing treatment for the child in the early and non-infectious stages of the disease, and for the delicate contact. Such schools were centres for the teaching of hygiene and were a useful means of educating the public. The design of the open-air school had also had a valuable effect on the planning of ordinary school buildings.

Councillor **Stewart Reid** (Glasgow) and Alderman T. **Hamblett** (St. Helens) also discussed the principles upon which open-air schools were designed, and urged the adoption of such principles by ordinary schools—a measure which they thought would go a long way towards eradicating tuberculosis, not only in childhood but also in later life. School feeding was also probably one of the most important functions they had to perform.

NATIONAL CONFERENCE ON MATERNITY AND CHILD WELFARE

THE CHILD FROM TWO TO FIVE

The first day's sessions of this conference[1] were held in the London County Hall, Westminster, on July 1st, under the chairmanship of Mr. **Somerville Hastings** (chairman of the hospitals and medical services committee, L.C.C.). After a short opening speech by Lord **Snell** (chairman of the L.C.C.), the presidential address was delivered by Sir **Kingsley Wood**, Minister of Health. He said that satisfaction with the steady progress made in child welfare must be tempered by our failure to improve the toll of maternal mortality. There had been a consistent reduction in deaths, among infants and among children between the ages of one and five years, largely brought about by the work of health visitors in the homes, and that of infant welfare centres. There had been a gradual decline in the percentage of children entering school in need of medical treatment. Few areas now failed to provide the essential features of a progressive child welfare service, but there was evidence than an inadequate number of toddlers were benefiting by it. The remedy lay in instruction of the public and arousing of public interest. It was impossible to emphasise too strongly the importance of better housing; if we could eliminate the majority of slums within the next five years, our generation would have given one of the greatest contributions to the health of the people ever made. The distressing fact that maternal mortality had not declined was a matter of grave concern and a blot on the good health record of the country. Maternal mortality was a complex problem and did not admit of any simple solution. An investigation was being carried out by medical officers of the Ministry of Health, who were studying conditions in a number of areas where, in the last ten years, the mean of the maternal mortality-rate had been above the average for the country as a whole. About half of these areas had already been visited, and when the inquiry was complete the findings were to be examined by the medical department of the ministry in consultation with Sir Comyns Berkeley, and it was hoped that much might be learned from this piece of research.

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[1] Organised on behalf of the National Council for Maternity and Child Welfare and a number of constituent bodies by the National Association for the Prevention of Infant Mortality.

Mr. Somerville Hastings emphasised the importance of the age-period of two to five years. A number of diseases and affections which might last throughout life had their origin in that period. Dental decay, tuberculosis, rheumatism, deafness, and nasal disease were among such complaints, and any disease at that age was liable to leave a scar on the constitution.

Dr. G. F. McCleary reported on the results of an investigation promoted by the National Society for the Prevention of Infant Mortality. An inquiry form had been issued to 514 local authorities in Great Britain and Northern Ireland, who were asked to indicate what measures were employed in their areas to promote the physical and mental welfare of children from two to five years of age. Replies were received from 369 authorities, and the measures most generally adopted were found to be supervision of toddlers in centres and by health visiting, provision of food (chiefly milk), treatment of minor ailments, and orthopædic and dental clinics. Little provision had been made for child guidance clinics, day nurseries, playrooms, and playgrounds, and—particularly deplorable—only 62 nursery schools, with accommodation for about 5000 children, had been established and officially recognised, in the whole of England and Wales. The chief obstacle in promoting the welfare of children between two and five was said to be parental ignorance and apathy in 96 out of 159 replies. Other causes were stated to be bad housing, poverty and unemployment, and financial stringency. Dr. McCleary said a study of the replies left him with the impression that the most urgent needs were more nursery schools and an extensive development of instruction in parentcraft.

Dr. Ethel Cassie (Medical Officer for Maternity and Child Welfare, Birmingham) said she was not convinced that a really good beginning had been made. The proportion of toddlers attending centres, even when special sessions were arranged for them, was disappointingly small, and some local authorities were content if these children received one visit a year from a health visitor, while the majority were not seen more than twice a year. She thought systematic medical inspection and home visiting the first necessities.

Dr. G. F. Still (National Institute for the Prevention of Infant Mortality) presided over the afternoon session, when the subject for discussion was Facilities for Convalescent Treatment of the Child under Five Years.

Dr. Margaret Hogarth (Divisional Medical Officer, L.C.C.) said that the London County Council arranged holidays for about 6000 children a year, but many of these were not strictly convalescent, and the accommodation for children under five was very small. The toddler was nobody's child, falling between the Ministry of Health and the Board of Education. This was very unfortunate in view of the great importance of the early years; the younger the child the more lasting were the results of illness or privation. Convalescence was carefully organised to ensure that children who had been really ill were sent to homes where skilled care was available. The home conditions to which children returned were most important; homes were visited and advice was given. In connexion with new housing schemes it would be a good thing if mothers could be helped with their budgeting and cooking. Provision of convalescence for young children was an urgent need and one which should be recognised by every local authority.

Dr. Leslie Housden spoke on the main causes of ill-health in the children of poor homes. These he considered to be emotional unrest and unhappiness (often due to over-large families), parental ignorance, poor feeding, lack of routine and discipline, and absence of fresh air and sunshine. He recommended simple education in non-technical language, inculcating a spirit of assurance and a belief that the new-born baby is generally healthy and only requires a mother's care to keep it so. The right course, he thought, was to concentrate on the teaching of mothercraft before marriage and to interfere as little as possible afterwards.

Dr. Alan Moncrieff urged the recognition of convalescent homes as an essential part of the national health services. Some conditions in young children demanded convalescence if they were to be completely cured. Chronic lung disease would largely disappear if children suffering from measles or whooping-cough could have a long period of convalescence. The same applied to tonsillectomy and chronic digestive disorders, and it was important that convalescent homes should take children earlier after acute illnesses. The length of stay must be adequate, three weeks being regarded as an absolute minimum.

(To be concluded)

MEDICINE AND THE LAW

Inquest on Human Arm Prohibited

In our issue of June 15th our correspondent from Australia described the unusual medico-legal problem associated with the discovery of a human arm in the body of a shark on the Coogie beach. The story is carried further in the *Times* of June 25th, where a message from Sydney describes the intervention of the Supreme Court of New South Wales to stop the inquest on the ground that a human arm does not constitute a body. It is understood that a man named James Smith has been missing in circumstances suggesting the possible theory that he was murdered and that his body was disposed of by throwing it to the sharks. The arm has been identified by tattoo marks and fingerprints as the arm of James Smith. Medical evidence indicated that it was apparently severed from a dead body. A man has been charged with the murder of Smith. At the instance of the accused the Supreme Court was asked to grant an order prohibiting the inquest from proceeding. Mr. Justice Halse Rogers granted a prohibition. His decision, he said, was based solely on the question of what constitutes a body; a coroner is obliged to view a body to assist him in reaching a verdict, and an arm is not a body; if the inquest proceeded, separate limbs, found in the jurisdictions of different coronerships, might be the subject of separate inquests.

No such point arose lately in England at the inconclusive inquest on the severed legs found on the Southern Railway; but then there was no accused person who had any occasion to object. In the Australian case the defence is entitled to rely on the difficulty and danger of proving a charge of murder where there is no body, and in that connexion may be interested to prevent an arm being treated as a body even in the coroner's court. The absence of a body did not prevent a conviction for murder in England not long ago in the case of the boy whose body, by the confession of the accused, had been disposed of by placing it on a burning dump. As regards inquests in England, Section 18 of the Coroners (Amendment) Act of 1926 enables the Home Office to direct an inquisition where a coroner reports a suspicious case in which, "owing to the destruction of the body by fire or otherwise, or to the fact that the body is lying in a place from which it cannot be recovered, an inquest cannot be held except by virtue of the provisions of this section." This section was intended to cover such instances as those of a body falling into a furnace or into a disused pit shaft; it was not meant to cover cases of mere mysterious disappearance without proof of death and with no evidence of destruction or inaccessibility. In the Sydney case there seems to be good prima facie evidence of the death of James Smith. There is no statutory definition of what constitutes a body for the purpose of inquests in England. The coroner is allowed considerable discretion. Many coroners of experience open inquests on almost any recognisable portion of a human being found in suspicious circumstances and, after taking the available evidence, adjourn for a reasonable period to allow for further search and inquiry. Under Section 6 of the Act of 1887, as explained by Section 19 of the Act of 1926, the High Court in England can quash an inquest and order a fresh inquest to be held where the discovery of new facts or further evidence makes this course desirable. In Coke's Reports (5 Rep. 110) and in Hawkins' Pleas of the Crown there are dicta which suggest that a small part of the body should not count as a body for the purpose of an inquest. It is usual nowadays, however, to assume that the advance in forensic medicine and the greater value of modern post-mortem examinations have contributed so much assistance in arriving at a verdict that the dicta of Coke and Hawkins are no longer so highly respected.

The Risks of Petrol and Explosives

The annual report of His Majesty's Inspectors of Explosives for the year 1934 (Cmd. 4934, price 9*d*.) shows the wide range of dangerous accidents due to ignorance or carelessness. The inspectors have authority under the Petroleum (Consolidation) Act as well as under the Explosives Acts and, as in previous years, they ask for greater publicity in the matter of the risks of using petrol in the home. They emphasise that petrol vapour, being much heavier than air, may flow out of a basin on to the floor, be carried by the draught to the nearest fire, and on ignition may flash back and envelop the person who is using it for dry-cleaning. They explain that the rubbing of fabrics (especially silks) in petrol may cause a spark of static electricity; such accidents lead to the upsetting of the basin with probably fatal results from the ensuing fire. Waste petrol poured down a drain has caused fire or explosion and has killed workmen in sewers. Several accidents occurred in 1934 during the fuelling of motor vehicles, either through leaving the engine running or through petrol falling on hot exhaust pipes or through acetylene lamps not being extinguished. One man was killed when the backfire from a stationary engine ignited spilt petrol. Persons were injured by explosion following a match struck to examine the contents of a petrol tank. The directions printed for use with Primus stoves state that no fuel other than paraffin or kerosene should be used; somebody at Morecambe used petrol with a fatal result. Special precautions are prescribed by law in the manufacture and conveyance of explosives and in their use in mines and elsewhere. Those concerned usually know the dangers. Children, however, run risks against which, as the report shows, it is hard to protect them. Thus two boys find a couple of grenades in an ashpit and throw them on a fire. A boy uses as a football something he sees in the road; it turns out to be a phosphorus grenade which has fallen off a dust-cart; it explodes when he kicks it. Boys find a shell on War Office land and throw it about till it goes off and injures them. A woman actually uses a 37 mm. shell to break up coal until the hammering at length explodes it. Evidently abandoned war relics and trophies are a constant peril. The chemical experiments of youthful students also lead to injury. A boy scrapes out the bore of a toy cannon previously charged with a mixture of potassium chlorate, amorphous phosphorus, sulphur, and aluminium dust; another boy mixes potassium chlorate and amorphous phosphorus and pours it into a drinking straw. In both cases there is an explosion. Articles in boys' papers are believed to stimulate these adventures; in 1927 there was an outbreak of accidents of this kind after the publication of an account showing how to produce coloured fires. His Majesty's inspectors of explosives say that the schoolboy's experiments are a breach of the law and that two Orders in Council of 1894 and 1905 prohibit the manufacture of fireworks containing compositions of sulphur or phosphorus in admixture with chlorates. Unfortunately a schoolboy's education probably does not yet extend to a knowledge of the multifarious Orders in Council under the Explosives Acts. Even if he knew that his experiment was a criminal offence, he might pursue it with no less ardour. The inspectors' report admits that it is a formidable matter to extract various statutory requirements from a mass of Acts, Orders in Council, and Orders of the Secretary of State. There certainly seems a strong case for simplifying the law as well as for reiterating for public information the dangers to which the report draws attention.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

NEUROSES IN MEDICAL PRACTICE

Dr. T. A. Ross, who delivered the Morison lectures before the Royal College of Physicians of Edinburgh last week, took as his subject the teaching of the neuroses to medical students. He began by emphasising the failure of the profession either to recognise or to treat the neuroses. Over a third of the patients seen in general practice, he said, are suffering from symptoms which are psychogenetic. The nature of the symptoms is seldom recognised; the patient's ill-health is perpetuated by imaginary diagnosis such as "nervous exhaustion" and he is advised to take things easily. The failure of the medical profession to recognise neurotic symptoms was, he said, responsible for the success of quack treatment. Quack treatment always promises cure, and this promise is sufficient to remove a large number of symptoms. Dr. Ross went on to consider the qualifications of the psychiatrist, the psycho-analyst, and the neurologist to teach the neuroses to medical students. He concluded that none of these specialists were suitable, but that the common forms of neuroses should be demonstrated to the student by the general physician who should be qualified to recognise and to treat them. He emphasised that the subject should be taught by the general physician and surgeon, so that the student should come to realise that in every case it is necessary to consider and adjust the patient's attitude to his symptoms, and to correct the fear which underlies nearly all neurotic symptoms.

Dr. Ross's lectures were much appreciated by the large numbers who attended. Dr. Ross said that his criticisms were not directed so much at the Edinburgh school as at others: he believed that the profession in Edinburgh were more alive to the importance of teaching the neuroses than were the teachers in other schools.

PARIS

(FROM OUR OWN CORRESPONDENT)

FOREIGN DOCTORS IN FRANCE

On June 27th the Senate passed the new provisions relating to the Practice of Medicine and Dentistry by Foreigners.[1] These do not affect existing practitioners but will make it more difficult in the future for foreign doctors or foreign nationals to earn their living in France. The movement, as will be seen below, is not a new one; it is generally held to be aimed at Rumanian nationals, of whom very many take their medical course in France. The provisions are set out now for the information of our readers, though the measure may be shelved at any rate until the autumn session.

In 1933 the French Government adopted a law which compelled every doctor who wished to practise in France to fulfil two conditions: he must, in addition to a university diploma, obtain the existing State diploma, and he must also become naturalised, unless he intended to proceed forthwith to one of the protectorates. Students were not required to naturalise. The French nation has found this an unsatisfactory arrangement, as more and more students have poured into French medical schools since it was passed. As a result both Chambers have received proposals for amending the situation. M. Armbruster, by whose name the law of 1933 is commonly known, had a motion on the Order Paper of the Senate some time ago, but its discussion was postponed by the death of the Minister of Education. In the meantime the Chamber of Deputies considered proposals brought forward by M. Cousin. The two propositions were so much alike that M. Armbruster's was, by consent, set aside in favour of a discussion in the Senate of M. Cousin's proposals as passed by the Lower House, with some minor modifications. M. le Gorgeu, the rapporteur, stressed the urgent need for action, pointing out that from 1925 to 1933, inclusive, the Prefecture of Police of the Seine had registered 1974 French and 402 foreign doctors, and that two-thirds of the 1530 foreign students attending French medical schools during 1934–35 probably intended to practise in France. It was made clear in the course of the discussion that a distinction must be drawn between foreign students who came to study French medicine and dentistry, returning home to practise, and those who seek to secure the benefits of practising their profession in France. For the first class no welcome is too warm; the second must be strictly limited in order that the French national may be protected in his profession.

THE NEW PROVISIONS

Article 1 limits the practice of medicine and dentistry in France to two classes of people: those holding the French State diploma or specially exempt under various laws of 1892–1927; and French citizens or subjects or those proceeding to countries under a French protectorate. (The words "ou sous mandat français" were added by the Chamber of Deputies, caused a certain amount of argument in the Senate and were finally dropped by consent.) In addition, foreign countries or doctors of foreign nationality may in certain cases obtain a dispensation from naturalisation under conditions of reciprocity. Such dispensations are to be given by individual decree. Special exemption is also provided for doctors from the Saar who were naturalised before March 1st, 1935.

Article 2 provides that a foreigner who possesses a diploma from his own country must pass all the French State diploma examinations but may be excused up to three years of study. The same regulations apply to those holding a French university degree of doctor of medicine except that they may be excused up to four years. This article provoked, said M. le Gorgeu, almost endless discussion before it was drawn up in the form presented to the Senate. Some people had even suggested abolishing the university diploma altogether in order to solve the problem described as "transforming a university diploma into a State one." Some of the associations of doctors and medical students wanted those who had degrees from another country to be compelled to go through the whole French curriculum, but this was regarded as a little excessive, and it was finally agreed and passed by the Senate without discussion in its present form.

Article 3 practically re-enacts the law of 1933 which does not allow foreign students any relaxation from the State diploma syllabus or examination however long they have studied in a foreign country. Any foreign student wishing to join a French medical school with a view to obtaining a State diploma must show that he has studied physics, chemistry, and biology, and must also possess all the qualifications necessary to enable him to enroll himself as a medical student in his own country. Subject to a slight amendment dealing with the position of Syria, this also was passed.

Articles 4, 5, and 6, which caused no discussion in the Senate, apply corresponding provisions to dentists and dental students and arrange for the investigation of foreign diplomas and degrees. During the first six months after the passing of this law prefects are charged with the duty of verifying the titles and diplomas of all doctors and dentists practising in France. Certain fines are laid down for practitioners who fail to comply with the requirements of verification.

The seventh Article is important in that it deals with the periods of time that must elapse before foreigners may practise, after obtaining their State diplomas. The Act of 1933 made no distinction between those who had completed their military service and those who had not. The present measure allows those who have carried out their military obligation to start practice as soon as they have obtained the State diploma, and the same privilege is extended to anyone who has served in the Army as a volunteer since 1914. For those who have not served, owing to exemption by a military board, and for women, there is to be a period dating from the acquisition of the diploma equal to the time of service which he or she has not served. Normally this means two years, but might be less for a man who had done part of his service and then obtained exemption. During this period doctors and dentists may do locum tenens work in order to earn a living and to keep their studies fresh in their minds. Foreigners living in France are not compelled to do military service if they are over 30, if bachelors; the age is 28 if they are married and have one child, and 27 if they have two children. This exemption often encourages foreigners to postpone naturalisation until they are 30, so as to escape conscription. This practice is naturally not favoured, and such persons are penalised by a clause in this article which says that any doctor or dentist who is exempted from military service on the grounds of age must delay starting practice for double the period of military service. In any case naturalised foreigners must wait five years before they may occupy any public position, unless they have served as volunteers on active service since 1914. There was some discussion as to the meaning of "public position," and M. le Gorgeu said that the Commission had deliberately refrained from defining it, and that it would be defined by regulation afterwards. It was certainly not intended to include free medical service to the poor, or vaccination, or to interfere with the practice of his profession by a foreign specialist who happened to be the only one available in a country district.

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[1] A copy of these new provisions is available in this office for inspection.—Ed. L.

The provisions are not to be retrospective; any foreign doctor who already holds a public office in France will continue to hold it.

An amendment introduced by M. Maurice Viollette sought to reinstate a clause which had been put in by the Chamber of Deputies and deleted by the commission which had prepared the agreed Bill for the Senate. This clause exempted from the above conditions foreign students who had actually started their studies and who applied for a naturalisation within three months. M. Viollette argued that it was very unfair to slam the door in the faces of students who had been told in 1933 that their position was safe. He provoked some applause for his point of view, but M. Armbruster and M. le Gorgeu declared that if a mistake had been made in 1933 it must be put right, and that French nationals must come before everyone else. The amendment was lost by 253 votes to 28. An amendment moved by M. E. Sari exempted foreign students who had married French women and become the fathers of French children and had already applied for naturalisation.

Article 8 repealed previous enactments contrary to the new one.

THE PARISIAN'S CHANGING MENU

The Parisian of to-day does not, it would seem, eat what his father ate 30 years ago. Various investigators have recently come to the conclusion that bread is rapidly going out of fashion and milk and butter are coming in. Opinions differ as to the reasons for the Parisian's flight from bread. Some blame the intrinsic qualities of the bread itself, which they find deplorable, and others maintain that it is deserted for milk, butter, and other good things because the standard of living has risen, and the facilities for conveying and storing perishable foodstuffs have been enormously improved; the milk in Paris a hundred years ago was highly diluted sewage with an unstinted supply of typhoid and paratyphoid bacilli. Thirty years ago, according to Dr. A. Gauducheau (Rev. d'Hyg. et de Méd. Prévent., June, 1935, p. 434), the daily menu of the average Parisian included 420 g. of bread, 213 g. of milk, and 28 g. of fat, including butter. In 1930, he ate only 320 g. of bread, or 24 per cent. less than he ate at the end of last century. But his consumption of milk has risen to 400 g., and his consumption of fats to 70 g. It may be that his calorie consumption has changed but little; what has changed is the source of his calories. It has been calculated that the peasant on the land gets half his calories from his bread which costs less than a quarter of his complete bill of fare. In well-to-do families, however, the cost of bread is hardly one-tenth of the food bill.

THE SECOND INTERNATIONAL CONGRESS OF MENTAL HYGIENE

That tireless and provident organiser, Mr. Clifford W. Beers, has already reached an advanced stage in his preparations for the Second International Congress of Mental Hygiene which is to be held in Paris, July 27th–31st, 1936. His preliminary programme contains many distinguished names and the titles of many papers on interesting subjects. Prof. Henri Claude will be the honorary president, and Dr. E. Toulouse, president of the congress and of its executive committee. Dr. A. Ley will be the vice-president of the executive committee, Dr. G. Genil-Perrin, secretary-general, and M. Robert Demachy, treasurer. The president of the programme committee will be Dr. René Charpentier, to whom all inquiries about the programme of the congress should be addressed at 119, Rue Perronet, Neuilly-sur-Seine (Seine), France. The address of the secretariat of the congress is 1, Rue Cabanis, Paris, XIV. Every "adherent member" will be asked to contribute 125 francs, and every National Mental Hygiene League 500 francs towards the expenses of the congress. Among the Anglo-Saxons listed to speak are Dr. C. S. Myers, F.R.S. (London), on mental hygiene and intellectural work; Prof. W. A. White (Washington) on the prevention of alcoholism; Prof. D. K. Henderson (Edinburgh) on the individual and social prevention of suicide; and Sir Hubert Bond (London) on a scheme for an international classification and nomenclature of mental disorders.

MATERNAL MORTALITY COMMITTEE

A CONFERENCE called by the Maternal Mortality Committee[1] was held on June 25th in the Livingstone Hall, the chair being taken by Lady Denman. The morning session was opened by Dame Janet Campbell, who explained the policy of the committee; the afternoon session by Dr. Topping, who dealt with the scheme which he had initiated at Rochdale by which the maternal mortality-rate there had been so appreciably reduced.

The speakers included Mrs. Baldwin, who urged the initiation of local committees to popularise antenatal clinics; Dr. Fairbairn, the president of the

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[1] The committee is constituted as follows: Mrs. H. J. Tennant, Lady Iveagh, M.P., Miss G. Tuckwell, Lady Barrett, M.D., Mrs. Barton, Mrs. Bramwell Booth, Lady Margaret Boscawen, Lady Cynthia Colville, Lady Crozier, Lady Erleigh, Lady Fitzalan, Miss Alice Gregory, Miss Haldane, Mary Lady Harcourt, Lady Hillingdon, Mrs. Hislop, Mrs. Hubback, Mrs. Randall Hosking, Mr. Kershaw, Lady Noel-Buxton, Mrs. William Piercy, Miss Sutherland, and Mrs. Usher.

British College of Obstetricians and Gynæcologists, who commended the policy as a whole; Mr. Eardley Holland, also representing the British College, who emphasised the importance of a post-graduate training for doctors; Prof. James Young, of the Postgraduate Medical School; Dr. Harold Waller, of the Royal College of St. Katherine, who urged that the care of mother and baby should everywhere be the responsibility of one and the same public health authority, and who also emphasised the importance of a post-graduate training; and Miss Gregory, of the British Hospital for Mothers and Babies, who dealt with the training of midwives. Dr. Picton dealt with the Cheshire Antenatal Scheme and Lady Williams with the scheme in the Rhondda Valley.

The policy of the committee was summarised for the meeting as follows.

1. The institution in each area of a maternity service which, while paying attention to the varying needs and character of different localities, shall enable all women to obtain adequate antenatal, natal, and postnatal care. To this end special attention shall be paid to the following points :—

(*a*) Antenatal, natal, and postnatal care should be under the same medical guidance.

(*b*) Midwifery practice should be limited to doctors with post-graduate training and practice in obstetrics.

(*c*) Local schemes should be encouraged which would enable private practitioners so equipped to take part in the maternity services.

(*d*) The need of skilled obstetricians for all complicated cases.

(*e*) The extension of the period of midwives' training to two years.

(*f*) The advantage of a service of salaried midwives working under the direction of a hospital, a nursing association, or the local authority.

(*g*) The provision of a sufficiency of maternity beds, in properly equipped hospitals, for complicated cases, and for patients whose condition or home circumstances entail potential risk.

(*h*) An improved domiciliary service for women attended by a doctor or midwife; such service to provide trained maternity nursing.

(*i*) An adequate after-care service which is seldom, if at all, provided in maternity and child welfare schemes. Its object should be to ensure that the period of hospital and domiciliary care is sufficient for the mother's full restoration to health, and that the infant's early hold on life is secure. To this end the whole of the arrangements for the care of mother and baby should everywhere be the responsibility of one and the same public health authority.

2. Since we have not yet succeeded in applying effectively existing knowledge to the reduction either of maternal morbidity and mortality, or of the high death-rate of new-born infants, it is desirable that there should be established carefully planned model schemes in selected urban and rural districts. As part of the work thus undertaken, or as a separate task, an investigation is urgently needed of the extent to which childbirth is followed by disability. A special grant from public funds should be available for the encouragement of such schemes.

3. Compulsory immediate, confidential notification to the M.O.H. of the local supervising authority of all deaths occurring during pregnancy, and of all those following or associated with childbirth and abortion.

The following societies accepted the invitation to send delegates :—

Queen's Institute of District Nursing; Central Women's Advisory Committee of the National Union of Conservative and Unionist Associations; Women's Section of the Labour Party; Standing Joint Committee of Industrial Women's Organisations; Society of Medical Officers of Health; British Legion, Women's Section; College of Nursing; Catholic Women's League; National Women Citizens' Associations; Fabian Society, Women's Section; Midwives' Institute; National Council of Women; National Baby Week Council; National Council for Maternity and Child Welfare; National Council for Equal Citizenship; National Council of Evangelical Free Churches, Women's Council; Salvation Army; Women Public Health Officers' Association; Women's Coöperative Guild; National Liberal Federation; National Federation of Women's Institutes; Union of Jewish Women; British College of Obstetricians and Gynæcologists.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. A. Craig to *President* for course; E. Heffernan to *London*; J. F. M. Campbell to *Victory* for R.N. Hospl., Haslar; A. W. North to *President* for service inside Admiralty; F. G. Hunt to *President* for R.A.F. Medical Officers' course; and O. D. Brownfield to *Ramillies* addl.; and A. W. Cocking to *Valiant*.

Surg. Lt.-Comdrs. R. G. Anthony to *Drake* for R.N. Hospl., Plymouth; and F. G. V. Scovell to *Pembroke* for Sheerness Dockyard.

Surg. Lt.-Comdrs. (D.) O. J. Barrable to *Pembroke* for R.N.B.; L. A. Loules to *Drake* for R.N.B.; and T. Hunt to *Victory* for R.N.B.

Surg. Lts. L. G. Yendoll to *Victory* for R.N. Hospl., Haslar; W. A. Ryan to *Ladybird*; W. Greaves to *Terror II* for Singapore Naval Base; and A. Long to *Pembroke* for R.N. Hospl., Chatham.

The following promotions have been made :—

Surg.-Comdr. to Surg.-Capt.: E. C. Holtom, O.B.E., E. Moxon-Browne, H. R. B. Hull, and C. M. R. Thatcher.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdrs. W. H. Butcher to *Caledon*, and R. Hall to *Cardiff*.

ROYAL ARMY MEDICAL CORPS

TERRITORIAL ARMY

Lt.-Col. & Bt. Col. E. A. C. Fazan, M.C., T.D., from 5th Bn. R. Sussex R. (supern.), to be Lt.-Col. & Bt. Col.

Capt. A. Angus to be Maj.

Lieuts. to be Capts.: A. W. Henderson, W. G. Bisset, H. Sissons, T. N. Rudd, W. P. Purvis, J. T. Watkins, and R. D. W. Butler.

D. H. Young (late Cadet C.S.M., Queen's Univ. Contgt., Canadian O.T.C.), to be Lt.

Supernumerary for service with the O.T.C.—Lt. W. M. Nichols to be Capt.

ROYAL AIR FORCE

The increased work caused by the expansion scheme has led to a division of the duties of the Central Medical Board. No. 1 Central Medical Board at 3-4, Clement's Inn, London, W.C., will carry out all medical examinations in connexion with the Central Medical Establishment with the exception of those for *ab initio* entries. No. 2 Central Medical Board at Astor House, Aldwych, W.C., will carry out all *ab initio* medical examinations. The personnel of both medical boards will be held on the establishment of the C.M.E.

The undermentioned promotions have been made :—

Group Capt. to be Air Commodore: W. Tyrrell, D.S.O., M.C.

Wing Comdrs. to be Group Capts.: D'Arcy Power, M.C., K. Biggs, M.C., and E. W. Craig, M.C.

Squadron Leaders to be Wing Comdrs.: V. R. Smith, P. C. Livingston, C. P. Barber, A. Briscoe, C. T. O'Neill, O.B.E., J. K. R. Landells, and E. D. D. Dickson.

Dental Branch.—Squadron Leader L. Somerville-Woodiwis, L.D.S. is promoted to the rank of Wing Commander.

Flight Lts. W. D. Guyler to Home Aircraft Depôt, Henlow; J. E. Willoughby to Headquarters, Coastal Area, Lee-on-the-Solent.

CORRESPONDENCE

TREATMENT OF SCABIES

To the Editor of THE LANCET

SIR,—Dr. R. M. Fraser in your issue of May 25th rightly refers to the prevalence of scabies as a subject of general public interest, but some of the points which he raises provide matter for discussion. The answer to his query regarding the use of sulphur in the treatment of scabies seems to lie in the desire for a slowly volatile substance, which will penetrate the burrows made by the mites while causing the minimum amount of damage to the tissues of the host. Norman Walker in his "Introduction to Dermatology" (8th edition) says: "Were we as familiar with the causes of all infective inflammations, and had we as sure a remedy for their destruction as we have for the acarus in sulphur, the treatment of the diseases of the skin would be very much simplified." Undoubtedly treatment by sulphur, involving as it does in a proportion of cases an irritant dermatitis, is far from ideal, but it may be presumed that dermatologists throughout the world would not be content to employ such treatment without having sought, apparently unsuccessfully, an alternative which destroys the invader without damaging the host.

The substances mentioned by Dr. Fraser are not familiar to me, but it appears that their use may be open to objection. One would hesitate to expose the whole body, as is necessary in treating a case of scabies, to the action of a substance sufficiently powerful to destroy beetles. There also must be some doubt as to the efficacy of a highly volatile substance, the active principle of which would be just as likely to be volatilised into the atmosphere as to penetrate burrows beneath the skin. The difficulty of attaining complete sterility of the skin before surgical operations throws a sidelight on the problem of penetration beneath the surface of the skin.

The treatment of scabies in the Army, though differing to no great extent from that employed in civil practice, probably attains better results for the reason that the patients are controlled in hospital. In the "Danish method," which is generally employed, the patients are made to bath and scrub themselves thoroughly on admission. Marcussen's ointment is then applied and the patient is put to bed, a second application of ointment being made 12 hours later. The patient remains in an atmosphere of sulphur for 24 hours. These two applications of sulphur ointment are usually sufficient to kill the parasites. At the end of 24 hours the patient is again bathed and provided with a complete change of clothing and bedding. Meantime all his clothing and bedding has been disinfected.

Application of an ointment may be a messy method of treatment, but it at least ensures prolonged contact of the drug with the surface to which it is applied.

It will be agreed that the ambulatory treatment necessarily employed in most cases in civil practice is beset with considerably more difficulty and is probably less satisfactory, but the results obtained in the Army are reasonably good and the treatment is relatively inexpensive.

I am, Sir, yours faithfully,

R. G. SHAW.

June 22nd.

Lieut.-Colonel, R.A.M.C.; Specialist in Dermatology, Aldershot Command.

AGGLUTINATION OF VIRUS BODIES

To the Editor of THE LANCET

SIR,—In your last issue Dr. M. H. Gordon raises the question of priority in connexion with the demonstration of the specific agglutination of elementary bodies by immune sera and criticises a statement in a recent paper by Schlesinger, Signy, and Amies (THE LANCET, May 18th, 1935, p. 1145) that this phenomenon was first described by Ledingham (1931) in the case of vaccinia and fowl-pox. May I as the person concerned in, but not responsible for, the statement in question, be allowed the privilege of commenting upon it? Dr. Gordon's historical researches do not seem to have been either very profound or very critical as he has contented himself with statements copied from one review to another but all pointing to an earlier demonstration of this reaction in 1913 by Paschen and Jakobsthal. The facts are these, and they were familiar to me before I undertook the task of securing pure suspensions of the elementary bodies of vaccinia and fowl-pox, for serological tests, and of which the paper by me in 1931 (THE LANCET, 1931, ii., 525) represented the outcome. That paper contains the following paragraph: "The only evidence I can find bearing on the influence of specific immune serum on these elementary bodies is that recorded by Prof. Paschen, who found and figured in stained preparations of precipitates obtained by the interaction of immune serum and lymph from vaccinated children, agglutinated masses of elementary bodies."

This is the substance of a statement by Paschen (Deutsch. med. Woch., 1913, xxxix., 2135) who, in the course of a lecture on vaccinia and variola referred to some work he had carried out with his colleague E. Jakobsthal. What he and his collaborator actually demonstrated was a precipitation reaction taking place between lymph from vaccinated child and rabbit immune serum, in the course of which the elementary bodies present in the lymph were found to be clumped on application of staining methods. "In dem Präzipitat konnte ich nun neben amorphem Eiweiss die Körperchen in grossen Haufen agglutiniert nachweisen."

That Paschen and Jakobsthal's experiment represented the nearest approach that could be made at that time to the demonstration of agglutinins in immune sera for elementary bodies was admitted by subsequent critical reviewers (see e.g. Winkler Erg. d. allg. Path. u. Path. Anat., 1924, xxi, 45), but, so long as precipitation and agglutination effects ran concurrently owing to impurity of the virus suspension the demonstration of specific agglutination of elementary bodies by the corresponding immune sera had to wait for new methods and for nearly twenty years. All honour, however, to Prof. Paschen for making such an intriguing observation at this early date, and may I add here my tribute of respect and thanks to a veteran worker and friend who gave me much assistance when I took up the study of these bodies by new methods and has since maintained a lively interest in them. The full significance of Paschen's observation was realised only when it was shown that elementary bodies in pure suspension were clumped by immune sera and when later my colleague Dr. Eagles and I were able to supply experimental proof of the ætiological connexion between the virus of vaccinia and the bodies of Paschen. The sentence, therefore, which Dr. Gordon criticises does not seem to require any substantial qualification in the interests of historical accuracy. One thing leads to another, and in these days it is always dangerous to say who did or did not first "describe" or "discover" anything, unless the thing described or discovered is precisely formulated.

May I be permitted to add, with reference to Dr. Gordon's further expressions of opinion in the course of his letter, that the microscopic agglutination test for variola elaborated by my colleague Dr. Amies would seem to me more scientifically founded from an immunological point of view than the macroscopic flocculation test with virus extracts, in that the former represents a simple and uncomplicated reaction between the elementary bodies of variola and the serum of the small-pox patient. In my opinion no pains should be spared to render the reagents employed in serological work with viruses the simplest and purest possible. The effective study of elementary bodies requires a lengthy apprenticeship and is in my view indispensable for any real advance in our knowledge of the biological nature of viruses.

I am, Sir, yours faithfully,
J. C. G. LEDINGHAM.
Lister Institute, London, June 29th.

ACHLORHYDRIA IN PYLORIC CARCINOMA

AN EARLY REFERENCE

To the Editor of THE LANCET

SIR,—Dr. J. Douglas Robertson has given us, in your last issue, some valuable observations on the development of achlorhydria in obstructive carcinoma of the pylorus. His conclusion that this is caused by the attendant gastritis must almost certainly be correct.

As a matter of historical interest and evidence of the early attention devoted to the pathological chemistry of the stomach by a physician of the Guy's school, I would refer him to papers by Golding Bird, in the *London Medical Gazette*, 1841–42, pp. 391 and 426. With the very laborious methods of quantitative analysis then available Golding Bird clearly demonstrated a steady decline in the percentage of hydrochloric acid in obstructive pyloric carcinoma, and also the simultaneous rise in the organic acids. He assumes, however, that the disappearance of the natural acid was due to failing vital powers.

I am, Sir, yours faithfully,
Wimpole-street, W., June 29th. JOHN A. RYLE.

FRACTURES OF THE CALCANEUS

To the Editor of THE LANCET

SIR,—May I congratulate Mr. D. C. Corry on his paper on fractures of the calcaneus involving the subastragaloid, appearing in your issue of June 22nd. I agree with him that it is essential to obtain movements of the subastragaloid and mid-tarsal joints in order to ensure a foot free from pain. The following case is of interest:—

In November, 1933, a postman reported at hospital with a history of a fall off a ladder 15 feet high on to his left heel 11 weeks previously. He had been in bed for ten days following the injury and had tried to return to work 8 weeks after the accident, but had found the foot so painful that this was impossible. On examination, movements at the ankle-joint, subastragaloid, and mid-tarsal joints were all markedly limited and painful on forcing them. There was also much periarticular thickening involving the ankle and tarsal joints. The foot was held in a pronounced valgus position. The X ray films showed a fracture of the calcaneus extending into the subastragaloid joint with shortening and widening of the bone. Impaction had taken place between the fragments and there was a good deal of overlapping. At first sight the above case presented as grave an outlook as possible, and a subastragaloid arthrodesis was considered. With two manipulations under an anæsthetic and regular treatment consisting of faradic contractions and movements, the patient was able to carry out his work as a postman at the end of 3½ months with the aid of a valgus insole. After 15 months of work he reports that the foot is still free from pain and the movements good, but it occasionally aches at the change of weather.

Pain in these cases is often described as being due to an arthritis in the subastragaloid joint. But if movement is obtained in this joint with freeing of the soft structures over the tarsal joints, a perfectly useful foot can often be obtained. Subastragaloid arthrodesis requires a patient to lie up for 4–8 months, and even after that period the foot may be painful unless the soft structures around the tarsal joints are treated. I am, Sir, yours faithfully,

Wimpole-street, W., June 29th. W. ELDON TUCKER.

LIGATURE OF SPLENIC ARTERY FOR ADVANCED SPLENIC ANÆMIA

To the Editor of THE LANCET

SIR,—I have read with great interest in your issue of April 20th the article on this subject by Mr. R. Burns-Watson. The operation of ligature of the splenic artery was referred to by J. W. McNee in his Lettsomian Lectures of 1931 (Brit. Med. Jour., 1931, i., 413) as likely to be of value in several types of splenic enlargement. I had an opportunity of discussing this question with Dr. McNee during the centenary meeting of the B.M.A. in London, and at that meeting I read a paper on Splenectomy with special reference to Splenomegalies in the Tropics. In this paper, published in the *Indian Medical Gazette*, of January, 1933, I stated that ligature of the splenic artery had been successfully performed on previous occasions and urged that this manœuvre was worthy of more extensive trial, particularly in India, where splenomegalies of the splenic anæmia type are by no means uncommon. Splenectomy is a very severe operation for such cases when extensive adhesions are present.

I have had no opportunity for performing this operation myself, as my present duties are mainly administrative, but I had hoped that other surgeons in India would be tempted to try this alternative and simpler procedure. Ligature of the splenic artery is not always easy, as it may be difficult to separate the artery from the greatly engorged veins, and ligature of the whole pedicle though easier would probably be more risky. Complications are also to be considered, and among these portal thrombosis is a serious possibility. It is gratifying to note that a surgeon in New Zealand has provided another example of the successful result of splenic ligature, and this time for an advanced case of so-called splenic anæmia.

In the *Indian Medical Gazette* of May, 1935, an article appears on Splenectomy for Tropical Splenomegally by A. N. Palit. Ten cases were operated on with a successful result in nine. But the more severe cases were apparently avoided, as ascites, signs suggesting cirrhosis, fixed immobile spleen, and so forth, are mentioned as contra-indications. It is just in these types of enlarged spleen that splenic ligature may be of value, while such cases if left to themselves usually terminate fatally. Will some surgeon in India provide us with more evidence as to the value of splenic ligature in these cases of the splenic anæmia type, which can only be removed by splenectomy with a high mortality risk. Reference is made in the article in the *Indian Medical Gazette* to ligature of the splenic artery, but only to dismiss it as a risky and not always an easy procedure.

Has splenic ligature ever been practised for splenic leukæmia, and with what result?

I am, Sir, yours faithfully,
F. P. CONNOR.
Madras, India, June 10th.

POTASSIUM CHLORIDE IN MYASTHENIA GRAVIS

To the Editor of THE LANCET

SIR,—The observations of Laurent and Walther on the influence of potassium chloride on myasthenia gravis are of very great interest. I have been able to confirm their results in two severe cases of the disease. Potassium chloride (12 grammes) in a tumblerful of water was given to each patient at 3.30 P.M. when the effect of an injection of Prostigmin 5 c.cm. had worn off. A decided improvement in the symptoms occurred, which lasted for about two hours. One patient had slight nausea and a feeling of heat.

A case of familial periodic paralysis, whose attacks occur during sleep and can be brought on at will by eating sugar late in the evening, was found by Dr. E. N. Allott to have abnormally low serum potassium during the attacks. The blood was taken about two hours before the paralysis wore off. During the intervals the blood potassium was normal.

	During the intervals.	*During an attack.*
Serum potassium ..	17·8 mg.%	10·0 mg.%
,, ,, ..	19·3 mg.%	12·6 mg.%

The serum calcium during an attack was 9·7 mg. per cent. and 10·3 mg. per cent. during an interval.

I have to thank Dr. W. D. Wiggins, the medical superintendent of the hospital, for permission to publish these observations.

I am, Sir, yours faithfully,
M. B. WALKER.
St. Alfege's Hospital, S.E., June 24th.

NON-TOXIC ANTIMONY ADMINISTRATION

To the Editor of THE LANCET

SIR,—Judging from the analogy of allied parasitic worms, trivalent antimony derivatives should prove more serviceable in the treatment of filariasis than pentavalent compounds, and it would likewise appear that those which contain the greatest quantity of antimony metal in a non-toxic form should prove most effective in destroying the embryos in the blood stream and lymphatic system. In human trypanosomiasis L. Van Hoof[1] has shown that a total of 0·98 g. of antimony metal is well tolerated by any patient when administered in one of the new organic antimony preparations which are on trial. This is in excess of that contained in the maximum total dose of tartar emetic and suggests that these allied preparations, which seem superior in action to tartar emetic in the treatment of both trypanosomiasis and schistosomiasis, are well deserving of trial in the destruction of microfilariæ.

For the last 20 years I have investigated the least toxic methods of treating bilharzia disease and similar parasitic conditions, but impaired hearing has prevented me obtaining any recent official post or other facilities for continuing this study on an adequate scale in Natal. I should be grateful to hear from anyone who could enable me to investigate further the uses of non-toxic antimony derivatives or would care to correspond with me on the subject. There would be little cost in obtaining the medicines, for a thorough scientific investigation of their relative values and what has already been completed indicates that antimony may now be administered without risk to the numerous skin conditions for which it has always been recommended.

I am, Sir, yours faithfully,
F. G. CAWSTON, M.D.
Britannia Buildings, West-street, Durban, June 9th.

CLEFT PALATE

To the Editor of THE LANCET

SIR,—I feel that I cannot allow Mr. David Levi's letter on this subject in your last issue to pass without comment. The whole object of the procedures advocated by myself has been that of restoration of function, and this can only be attained by operation based on sound anatomical and physiological principles. The proof of success lies not in the appearance of the suture line or in the apparent mobility of the palate, but in the ability of the patient to open and close the nasopharyngeal valve. There are many simple tests of proficiency in this matter, such as snorting and the ability to inflate balloons, &c. Restoration of this function is all that surgery can do and is, therefore, the aim of any repair of the palate; there is no need to do more than this and to do it in the neatest and most workmanlike fashion.

It is interesting to observe Mr. Levi repeating the remark, that the palatopharyngeus plays such an important part in speech. In my dissections of many normal palates and one or two cases of cleft palate I have been quite unable to correlate the action of this muscle with the speech mechanism as observed in life in the normal person. Again it is difficult to understand Mr. Levi's horror at destruction of the tensor palati, since, as my colleague Mr. James Whillis and myself have been able to show, the principal function of the tensor is not concerned with speech.

Mr. Levi says:

> "Pharyngoplasty, which was attempted even in pre-Listerian days, has been alternately used and discarded by surgeons the world over. It was brought into prominence by Rutenberg in 1876; he made a transverse incision in the pharynx and sutured it longitudinally. Botey in 1908 excised an ellipse from the posterior pharyngeal wall, and sutured the edges, while Sir Robert Woods in 1927 electrocoagulated the posterior pharyngeal wall. Mr. Wardill has modified and reintroduced Rutenberg's operation—evidently with some success—but I cannot help thinking that narrowing of the lumen of the nasopharynx is liable to interfere with the function of the palatopharyngeal sphincter."

It is news to me that, since pre-Listerian times, pharyngoplasty has been alternately used and discarded by surgeons the world over. Information at present in my possession would suggest that pharyngoplasty is gaining an increasing number of adherents. To say that I modified and reintroduced Rutenberg's operation is entirely incorrect, since my knowledge of Rutenberg, like most other peoples, dates from the publication of Dorrance's book. Pharyngoplasty, as designed by myself, was based entirely upon original anatomical research, and was not in any way founded on Rutenberg or on any one else. Since Dorrance produced his book, I have looked up Rutenberg's papers, and as I read them, admittedly with an imperfect knowledge of German, it would appear that he aimed at producing a pharyngeal scar, and only as an afterthought offered the suggestion of suturing in a longitudinal direction.

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[1] Ann. Belgian Soc. Trop. Med., No. 4, 1933, vol. xiii.

It is obvious that the method described by him was bound to be a failure and could not in any way approach the results of pharyngoplasty as carried out at the present time. Undoubtedly Rutenberg's ideas were sound, and it must be common knowledge that cases of cleft palate, subjected to removal of adenoids, very often speak very much worse after the operation. This is surely evidence in support of a need for something in the pharynx against which the palatal mechanism can act.

Mr. Levi is opposed to pharyngoplasty on the grounds that he, "cannot help thinking that narrowing of the lumen of the nasopharynx is liable to interfere with the function of the palatopharyngeal sphincter." The proof of the pudding is in the eating, and in the previous publication of my results I think I have amply demonstrated that pharyngoplasty restores the nasopharyngeal sphincter mechanism. Fortunately, Mr. Levi presents alternative methods of treatment which, he says, offer the greatest chance of success, and I think it is only fair to British surgery, and to sufferers from cleft palate in general, that he should give this benefit to others, laying his cards on the table and publishing his methods in detail together with a complete record of his results.

Finally, may I repeat, the aim of surgery of cleft palate is to restore the sufferers to normal with as little scarring, surgical or psychological, as possible. This can only be done by sound operation followed by a normal existence in which attention is not specially directed towards the child's deformity, such as inevitably occurs with speech training. I repeat, the necessity for speech training is either evidence of surgical failure or having missed the surgical boat.

I am, Sir, yours faithfully,

Newcastle-upon-Tyne, July 1st. W. E. M. WARDILL.

RADIOGRAPHY UPSIDE DOWN

To the Editor of THE LANCET

SIR,—I was interested in the annotation under this title in your issue of May 25th. Gravity certainly has a definite effect on the thoracic viscera and in the case of pneumothorax the intrapleural pressure will be found to vary considerably with the position of the patient. I have known a pressure of −12 −2 with the patient lying on the healthy side and the pneumothorax cavity uppermost to be converted into one of −5 +1 when he turned round. Presumably this change is caused by the weight of the viscera, and it is therefore important to have the patient in the same position at each refill if pressures are to be compared.

When the base of the lung is obscured in a case of effusion it can be seen by placing the patient on his side or even standing him on his head. This also enables one to get a view of the diaphragm and to detect early adherence of the base to the chest wall, a very common occurrence in effusion complicating pneumothorax. I published a short article on this subject with diagrams from X rays some years ago (Brit. Med. Jour., 1927, i., 135).

I am, Sir, yours faithfully,

L. S. T. BURRELL.

New Cavendish-street, W., July 1st.

PANEL AND CONTRACT PRACTICE

Physical or Mental Disability in an Insurance Practitioner

Clause 4 (4) of the Terms of Service provides that when the insurance committee, after consultation with the panel committee, are satisfied that owing to the continued absence or bodily or mental disability of an insurance practitioner, his obligations under the terms of service are not being adequately carried out, they may, with the consent of the Minister, give notice to the insured persons on his list that the practitioner is no longer in a position to carry out his obligations under the Terms of Service. This means in effect that although the practitioner's name is not automatically removed from the Medical List his insurance practice is scattered. The clause is not frequently brought into operation, but the London committee has just consulted with the local medical and panel committee who have concurred with their opinion that owing to the advanced age and enfeeblement of a practitioner he is not in a position adequately to discharge his obligations.

The practitioner, who registered in 1874, joined the Medical List in 1929 and changed his surname to that of his deceased predecessor with a view to carrying on the practice for the benefit of the children of the predecessor until one of them should become qualified, and so could succeed to the practice. Having regard to the special circumstances the committee consented to his employing an assistant, who, however, did practically the whole of the work, and early in 1932 the committee decided to withdraw their consent to the employment of an assistant. The practitioner appealed to the Minister and the appeal was upheld largely, it appears, on the understanding that the arrangement was likely to terminate at an early date as a result of the anticipated qualification of one or other of the children. The son qualified early in 1934 and the committee, with the concurrence of the panel committee, decided in January, 1935, to withdraw consent to the employment of an assistant as from March 31st, 1935. The son then joined the Medical List but did not succeed to the practice, and the practitioner indicated that he was introducing the son to the practice for a period of six months. The committee took the view that it had long been established that the practitioner's personal services in connexion with the practice had been very limited and they felt that the circumstances attending the so-called introduction were likely to differ in no essential particular from those which had prevailed during the past six years, and that these unsatisfactory arrangements should now be terminated.

The committee are now in a position to make a representation to the Minister of Health that owing to the advanced age and enfeebled condition of the practitioner he is not in a position adequately to discharge his obligations under the Terms of Service, with a request for the Minister's consent to the committee's making other arrangements for the medical treatment of his patients.

The Whitsuntide Conferences

Each year, round about Whitsuntide, conferences of various friendly and other societies are held, and it is rare for the medical profession to escape more or less vehement criticism, particularly in relation to their duties under the National Health Insurance Act. This year the attack centres on the profession in general rather than on the insurance doctor as such. We were told, it is reported, by a medical speaker at a congress held at Bridlington, that the medical profession has deteriorated, that it has become thoroughly commercialised, that insured persons are not reckoned as human beings but as so many units per head for profit making by big concerns, that there is a lack of proper surgery accommodation, and that there is no careful selection of doctors for working-class districts. We are, however, glad to be assured that the bulk of the doctors would like to give the insured person a square deal. All this from a medical man is rather astonishing. If there is a lack of proper surgery accommodation, surely the insurance committee, if made aware of it, would take appropriate action, but it is neither to be expected nor desired that committees should take unto themselves a roving commission to test the conditions under which doctors are carrying on their work. The careful selection of doctors for working-class districts is another flight of fancy which hardly bears examination in the cold light of reason. Insurance doctors with the largest lists are almost invariably found in the working-class districts, and in these days of keen competition it is the man who does his job, and not the slacker, who succeeds. When it is remembered that in London alone during 1934 no less than 8,482,787 prescriptions were issued, each of them representing a consultation and a potential complaint, it is significant that in only 39 cases was it necessary for the medical service subcommittee to investigate questions concerning insurance doctors.

Whitewash

A member of an insurance committee who recently alleged that medical members of medical service subcommittees went "for the purpose of whitewashing their colleagues" was invited at the next meeting by a medical member either to resign from the committee or to withdraw his remark and apologise to the members of the subcommittee. The member withdrew the remark and apologised. This subcommittee acts in a quasi-judicial capacity, and it is the duty of its members to lean neither to the side of the "defence" nor to that of the "prosecution." It must be remembered, however, that on the purely medical aspect of cases doctors tend to share a point of view differing somewhat from that of the layman. This is the outcome not only of their common training but of their knowledge of the difficulties of coping with the emergencies of practice, and should not be attributed to a "trades union" sentiment.

OBITUARY

JAMES ROBERTSON RIDDELL, F.R.F.P.&S. Glasg.

MEDICAL ELECTRICIAN, WESTERN INFIRMARY, GLASGOW

THE death occurred on Saturday, June 29th, at Bearsden, Dumbarton, of Dr. James Riddell, a pioneer radiologist. He was born at Glasgow in 1873, the son of the Rev. John Riddell, of the Wynd church, and received his medical education at the Royal Infirmary, Glasgow. He qualified in 1897 with the Scottish double diploma and held the appointments of house physician and house surgeon at the Infirmary. He was from the beginning of his professional career interested in radiology; though he was for a time in general practice, he soon began to work under the late Dr. John M'Intyre, the well-known laryngologist, who was surgeon to the Royal Infirmary and in charge of the electro-therapeutical department. These were the early days of the introduction of X ray work into medicine and Riddell was immediately interested in the developments so promised. A radiological department was instituted in the Infirmary, much practical work was published as a result, while Riddell became the recognised X ray specialist in the city. On the outbreak of war he saw service in the East, was radiologist at Salonika to the 38th General Hospital with the rank of Major, R.A.M.C. (T.), and became X ray expert to the Scottish Command. In 1920 a lectureship in radiology was founded at the University of Glasgow and Riddell, who had some years previously been elected F.R.F.P. & S., was invited to occupy the post, which carried with it the appointment of physician in charge of the X ray department of the Western Infirmary, a post which he filled at the time of his death. He contributed to medical journals some practical essays on the employment of X ray methods in malignant disease and in uterine fibroids, and generally on the therapeutics of radium, and in 1927 he wrote a valuable handbook on medical electricity and radiology. The work was intended to inform the student mainly as to the employment of apparatus, but the general information on electrical therapeutics and reactions and the influence of X rays on living tissues were practical, and also very full considering the size of the work, while special attention was devoted to regional examination. Like so many of the early X ray workers Riddell suffered frequently from exposures, but he never allowed the amount or the character of his work to be interfered with, and must be regarded as one of the victims to scientific progress. The record of his energy supplied by his colleagues shows him to have been indefatiguable in his work and remarkably sympathetic in his attitude towards his patients, always very numerous, and many from the less fortunate classes.

JOHN MARSHALL DAY, M.D. Dub.

THE death occurred recently of Dr. John Marshall Day who had for many years been resident medical superintendent of the Cork-street Fever Hospital, Dublin. Born at Tuam, the son of Mr. Marshall Day, he received his preliminary education at the Diocesan school, Tuam, and the Rathmines school, Dublin, proceeding to Trinity College, Dublin, for his university training. He graduated as M.B., B.Ch. Dublin in 1885, took the diploma in State medicine three years later, and afterwards proceeded to the M.D. degree. His professional career largely centred round the Cork-street hospital, for shortly after graduation he received his first appointment in the institution as clinical assistant; later he was appointed a resident medical officer and finally became superintendent.

A Dublin correspondent writes: "Day speedily won a high reputation as an expert in infectious diseases and for many years enjoyed a large consulting practice in that branch of medicine. He was held in high esteem by the medical profession of Dublin, many of whom were brought closely into touch with him in his character of head of the principal fever hospital of the city. Further, it was his duty to give clinical instruction in fevers to the Dublin students. This he had done for the past 25 years, and there are several generations of students who must have been impressed by Day's clear clinical teaching and also have memories of his peculiar faculty for arriving at judgments without being able to communicate the reasons."

Outside his official work Dr. Day was particularly interested in medical organisation, was for a number of years on the committee of the Irish Medical Association, and was for two years president. He took his recreation in hunting and farming, and had retired from active work for several years.

NORMAN BRAITHWAITE, M.B., B.S. Durh.

THE death occurred on June 7th of Dr. Norman Braithwaite, the son of the late Mr. T. W. Braithwaite of Bishop Auckland, as the result of a motor-car accident. Born in 1894 he graduated as M.B., B.S. Durh. in 1917. He was then house physician at the Royal Victoria Infirmary, Newcastle, and served also as assistant in the out-patient department of the Royal Infirmary, Edinburgh. During the war he held a commission as captain R.A.M.C. (T.F.) He afterwards practised at Deeping, while for a period he made several voyages as a ship's medical officer. Recently he acquired a practice at Brackley and on settling down there married. His wife was with him when the fatal collision occurred. He leaves a widow and a baby, and the domestic circumstances made his death particularly tragic.

PUBLIC HEALTH

Paratyphoid at Ipswich

AT the present time 32 members of the medical, nursing, and domestic staff of the East Suffolk and Ipswich Hospital are in the borough isolation hospital with paratyphoid fever. These include 2 resident medical officers, 1 sister, 18 nurses, and 11 maids. These cases were admitted in the middle of June, when 2 other persons who can be connected with the East Suffolk and Ipswich Hospital were also admitted. At the beginning of June 6 cases of paratyphoid were taken into the isolation hospital, but it has not been possible to establish any connexion between these and the later admissions. So far it has not been possible to find a carrier or other source of infection for the East Suffolk and Ipswich Hospital cases, but full investigations are being made in association with a medical officer from the Ministry of Health who is on the spot. We understand that no cases have occurred in the county of Suffolk apart from the Ipswich ones.

An Attack on Maternal Mortality

A striking reduction in the number of deaths from childbirth in the Rhondda Valley was reported by Sir Julien Cahn, as chairman of the National Birthday Trust Fund, at its annual meeting last week. The special campaign began eighteen months ago: in its first nine months there were 29 maternal deaths (over 3 per month), in the next three months there were 6 (2 per month), and in the first six months of this year there have been only 6 more (1 per month), while the number of non-fatal septic cases has fallen in proportion. This result Sir Julien attributed to the wholehearted coöperation and untiring zeal of all those connected with the work, and especially of Dr. J. D. Jenkins, until recently superintendent of maternity and child welfare. Every help and encouragement has been given by the local authorities of the area and their medical representatives, and two district sister superintendents have been spared by Queen Charlotte's Hospital to act as assistant inspectors of midwives under the Rhondda council. Nearly half the practising midwives in the area have now taken advantage of the offer made by the Fund to take free refresher courses at the Royal Infirmary, Cardiff. This has been made possible for them by the payment of compensation for cases lost during their absence. The grant of 15*s.* compensation to those midwives whose cases are referred to hospital, on the advice of the medical officer of the antenatal clinics, has apparently been instrumental in removing local opposition, and the attendance at the clinics have nearly doubled in the last few months. Two firms have generously supplied large quantities of disinfectant to the Fund, for use in the Rhondda area, without charge. Sir Julien added that as it appeared that malnutrition was a contributory factor in certain cases, special foodstuffs, recommended by the medical committee, have been made available to 210 mothers in the districts of the Rhondda and Llantrisant to the value of about 2*s.* 6*d.* per week per mother. "It is interesting to note that the sharp drop in the death-rate has occurred since the introduction of this scheme, which we are hoping to be able to continue until the end of the year. This was made possible by the successful result of Mrs. Stanley Baldwin's special Food Appeal."

The reports on the first year's efforts in the Rhondda Valley area have been so encouraging that the Fund has undertaken to continue the scheme for a second year. It is felt that light is being thrown upon the problem of high rates of maternal mortality, and that a successful outcome of the work undertaken in the Rhondda Valley will have far-reaching results.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 22ND, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1715; diphtheria, 847; enteric fever, 27; acute pneumonia (primary or influenzal), 702; puerperal fever, 36; puerperal pyrexia, 151; cerebrospinal fever, 15; acute poliomyelitis, 6; encephalitis lethargica, 7; dysentery, 7; and ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 28th was 2800, which included: Scarlet fever, 810; diphtheria, 1051; measles, 50; whooping-cough, 379; puerperal fever, 27 mothers (plus 7 babies); encephalitis lethargica, 269; poliomyelitis, 1. At St. Margaret's Hospital there were 20 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there were no deaths from small-pox or enteric fever, 23 (0) from measles, 5 (0) from scarlet fever, 20 (4) from whooping-cough, 23 (4) from diphtheria, 35 (13) from diarrhœa and enteritis under two years, and 35 (8) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 5 of the deaths from measles, and West Bromwich 3 of those from whooping-cough. Of the fatal cases of diphtheria 3 were in Birmingham. Diarrhœa and enteritis caused 3 deaths in Liverpool and 2 each in Hull and Newcastle-upon-Tyne. There were 4 deaths from influenza in Birmingham, 4 in Manchester, and 2 each in St. Helens and Stockport.

The number of stillbirths notified during the week was 292 (corresponding to a rate of 41 per 1000 total births), including 45 in London.

OVERCROWDING OF HOSPITAL WARDS.—The Royal Victoria Infirmary, Newcastle-on-Tyne, has decided to limit the number of beds in the wards, and in future the number for which the building is designed (614) will not be exceeded.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Specialist Medical Treatment and Local Authority Control

ON the motion for the second reading of the Hertfordshire County Council Bill in the House of Commons on June 26th,

Sir MURRAY SUETER said that Part IV of the Bill dealt with establishments for massage and special treatment. The object was to save the public from being imposed upon by spurious practitioners who were very active in connexion with electrical treatment. He (Sir M. Sueter) could give the House an example of electrical apparatus being in improper and ignorant hands. When he was in H.M.S. *Benbow* at Portsmouth they were experimenting with X ray apparatus, and they had a Röntgen ray tube and a fluorescent screen. They used to take photographs of the torpedo lieutenant's hands, and as they were experimenting one day they thought they would like to see what was in the doctor's brain. They put the Röntgen ray tube in front of the doctor's brain and examined it through the fluorescent screen. They saw that the tissue of the brain was different and they were delighted with the examination. But in the morning when the doctor was combing his hair it came out in handfuls: he was perfectly bald on one side. They had destroyed all his hair on that side. The doctor was rather annoyed, but fortunately in a few weeks' time it had grown again and all was well. That was an example of the danger of such electrical apparatus being in improper hands. The promotors of the Bill sought to have powers to deal with this matter.

Dr. O'DONOVAN said that the purpose of the Bill had his heartiest concurrence, but he thought that certain aspects dealt with in Part IV ought to be made public so that the Committee which would examine the Bill could see what his profession was thinking of this Private Bill legislation which was affecting professional work. Bills very similar to this had gone through Committee before, and this measure appeared in its present form largely because that was the form in which previous Private Bills had been passed by Private Bill Committees. If Clause 48 and the consequent Clauses of this measure became enshrined once more in an Act of Parliament without a variation of its wording men and women who practised massage, manicuring, chiropody, electric treatment, radiant heat treatment, light treatment and vapour or other bath treatment, would be compelled to notify the chief of police of their intention to practise these special branches of bio-physical medicine. As Part IV stood without explanatory amplification he suggested that its imputations were offensive to a great body of useful people and bore no relation to the conditions under which they carried out their work to-day. He was entitled to say that, for since 1921 he had been a teacher, an examiner and a practitioner in this special part of medical treatment and he had not discovered that those whom he examined, those whom he taught, or those with whom he daily worked, were so undesirable that they should be subject to the attention of the county police.

Medical practitioners were given a certain freedom from the oppressive restrictions in Part IV, that was to say, it was not required that every medical practitioner should notify the police of his desire to practise special branches of medicine. But medical practitioners, perhaps London experts, who wished to practise in Hertfordshire any of these special branches of medicine, were required annually to produce from Hertfordshire practitioners a certificate that they were fit to carry out the special technique of their work. It would be a fair and appropriate observation to make that Hertfordshire, even in its county town, had not a panel of experts who were competent to certify as to the competence of experts who might go to practise there. It was strange that this county council should wish a certificate of special competence on the part of doctors who practised a very minor branch of medicine, and yet was not particular as to the special fitness of those who were to operate in more dangerous, more venturesome and more serious ways. Any practitioner in Hertford could deliver women in difficult labour without being required to prove his special competence to the Hertfordshire County Council, but should he install a mercury lamp or an X ray apparatus he became a suspected person who must year by year prove his fitness. Furthermore, nurses, specially trained and certified by the Chartered Society of Massage and Gymnastics, were to be under the same obligation of producing yearly certificates of their competence. Although a doctor or a specially certified massage nurse might become licensed in a simple way, nevertheless, the county council asked powers to pass by-laws instructing them how they should keep their records. Up to now a professional man had been entitled to keep his records and conduct his business in the way best suited to his personality, but this county council wished powers to pass by-laws so that his card index and professional records should be such as commended themselves to the council's advisers.

There was another point. The county council wished, properly or improperly, to set up a form of Medical Register of its own, for it not only asked those who practised these special forms of treatment to submit their technical qualifications, but it asked powers to set out in its own behalf what those qualifications should be. In other words, through this Bill and similar Bills there would be up and down England a multitude of minor quasi-responsible General Medical Councils. There were two incorporated societies of chiropodists in England who seriously taught their students, who trained them and examined them well, and granted them certificates, but the Hertfordshire County Council, without waiting for action at the hands of the Privy Council which was seeking to promote a Charter for the registration of chiropodists, would set up its own register of chiropodists; and then those who had successful boot shops and paid large rates could plant tame chiropodists in their back rooms and claim all the privileges of those who would benefit by registration at the hands of the Privy Council which could not be long delayed. That seemed to him to be a real wrong.

There was much professional feeling in this matter. They had heard from the member for Hertford (Sir M. Sueter) his experiences with X rays. Those experiences, inaccurately and wrongly reported, were nevertheless experienced at the hands of a registered medical practitioner, not at the hands of an undesirable person. Those experiments on a doctor's head, presumably with the doctor's consent and not under Admiralty orders, were carried out presumably by a registered medical practitioner. What ever dose of X rays the gallant Admiral gave to the doctor's hair that hair could not fall out the next day. It would take three weeks to fall out.

Sir M. SUETER: The next morning the doctor came down and told us that his hair had fallen out. When I said his hair grew again in a few weeks it may have been a few months, but it grew successfully and he did not have any bad effects afterwards, but it actually happened and I saw it. It was in the early days of X rays.

Dr. O'DONOVAN said he wondered if the gallant Admiral would take it from him that X rays in those days and X rays in these days would behave in exactly the same way. Their difference might be explained by the fact that when the Admiral was doing those experiments with X rays he (Dr. O'Donovan) was also doing them, but he had been doing them ever since, and the Admiral might be a little behind current medical practice. Nevertheless, the fact remained that X rays were a dangerous weapon in the hand of inexperienced or unskilled operators, but this clause in the Bill did not exclude in any way the use of X rays by anybody. It excluded electrical treatment or other similar treatment, and he and his professional colleagues would be pleased to go into any court of law and give expert evidence that X ray treatment and radium treatment, which was even more dangerous, were in no proper and strict use of the word electrical treatment or similar treatment. Any argument founded on Sir M. Sueter's experience was only an argument that this definition clause should be re-drafted, that expert advice should be more widely sought in this work, and that a county council should not put itself in a lamb-like manner into the hands of those who were professional parliamentary draftsmen.

The Bill was read a second time.

Diseases of Animals Bill

In the House of Commons on June 26th Mr. ELLIOT, Minister for Agriculture, moved the second reading of the Diseases of Animals Bill, which has already passed through the House of Lords. He said that the main objects of the measure were first, to bring poultry within the provisions of the Diseases of Animals Acts, and second, to provide for the regulation of the manufacture and importation of certain therapeutic substances intended for veterinary purposes. The provisions under which they were now made and sold were very unsatisfactory and representations had been made to the Ministry for some time by agricultural interests. A standard for one of these substances was recommended by the Cattle Diseases Committee of the Economic Advisory Council. The Bill would go to Committee where there would be full opportunity for examining it in detail.

Mr. T. WILLIAMS said that the Labour Opposition offered no objection to this Bill; they thought it was very useful.

The Bill was read a second time and committed to a Standing Committee.

Health Services and Housing in Scotland

On Friday, June 28th, the House of Commons went into Committee of Supply on the Scottish Estimates. Captain BOURNE, Deputy Chairman of Committee, was in the chair. On a vote for £2,062,724, to complete the sum necessary to defray the charge for salaries and expenses of the Department of Health for Scotland, Mr. SKELTON, Under Secretary of State, pointed out that the health of the nation had never been so good, improvement being manifested in every direction save maternal mortality, where there had been a slight rise compared with last year, although it was about the same as the average of the last five years. A report on maternal mortality which had long been subject to anxious examination by experts, would, he said, be published in a few days, and was of a more intensive and exhaustive character than any previous examination of the question in either England or Scotland.

The Public Health Services Committee, which was appointed last year by the Secretary for Scotland, was carrying on its work with great energy and vigour, although he regretted to say that the chairman, Sir John Dove-Wilson, unfortunately died quite recently. He had been succeeded by one who would, he thought, command respect and approval in every section of the community, namely, Prof. Cathcart of Glasgow.

Dealing with the progress of housing Mr. Skelton said that the number of houses completed in 1933 numbered 20,915, but then, of course, subsidies to private enterprise were still going strong and there was not the same concentration on slum clearance. Of that figure of 20,915 houses 15,000 were local authority houses, and the balance were private enterprise houses. Last year the total was 18,417, 14,700 being local authority houses and 3,600 private enterprise houses. The most recent figures of completions showed that they were again increasing the numbers. In the first five months of 1934 6056 houses were completed, and in the first five months of this year 6,500, an increase of practically 500. On a rough estimate he believed that the local authorities completions, which were 14,719 for last year, might be in the neighbourhood of 17,000 for next year. They had this year the highest number of local authority houses under construction that there had ever been. At the end of May this year there were 18,119 local authority houses under construction, whereas in May last year there were only 14,488, and in the year before 17,035. Most striking of all was the progress of slum clearance under the present five-year plan, which began on Jan. 1st, 1934. The local authorities estimated their needs over the period to be 61,316 houses. The actual further building programmes submitted provided for 47,900 houses, or 78 per cent. of the total. Many of the local authorities had undertaken that if it was possible they would increase their programmes to such an extent that 92 per cent. of the needs would be undertaken in the five years. Mr. Skelton concluded by giving the figures dealing with the tenders for new houses which proved the skill and energy with which Scottish Local Authorities as a whole had undertaken the work dealing with the slums.

At the middle of June, 17½ months after the beginning of the five-year plan, tenders had been approved for 30,681 houses out of the 47,900, and of the 30,000 odd tenders approved only 6000 represented houses which had not been either begun or completed. That showed the zeal and energy with which the Scottish local authorities as a whole had undertaken the work of dealing with slums in the course of this new period. The momentum with which slum clearance was being tackled showed no signs of slackening. No tenders were being approved for two-room houses, and a very considerable proportion of the tenders were for four-room and some for five-room houses. Under the provision in the Rural Workers Act the reconditioning of farm cottages went steadily on. In the vast majority of cases of people removed from slums there was immediate and strong response to the improved conditions. It was also true that in the sphere of health the population of Scotland was increasingly responsive to the efforts that were made by public health authorities. Maternity and child welfare centres were constantly increasing in popularity.

Sir A. SINCLAIR said that they were glad to know that, broadly speaking, the health of the people of Scotland was good and was improving, but it still remained true, as was pointed out in the annual report of the Department of Health, that the public demand for hospital treatment was increasing. Unfortunately this demand was not being met. In regard to hospital services the report said:

> "Recently a study was made of the records of a large number of consecutive patients admitted to the medical wards of one of the best of our general hospitals. It was found that many of them had been ill for months or years prior to admission. Pressure on bed accommodation was so great that the duration of in-patient treatment had to be kept as short as possible. Only 26 per cent. of the patients reviewed remained in hospital for more than one month, and only two per cent. for more than three months. It is not surprising, therefore, that on discharge from the hospital more patients were classified as 'relieved' than as 'cured'." The report added: "It is impossible to regard such results with equanimity."

This was a serious matter and it was impossible to regard the condition of the hospitals in Scotland with equanimity. He would ask the Government to state what they were doing to remedy the state of affairs. A doctor who had returned after a number of years in the Malay States to take up an appointment in Scotland recently, told him that the hospital services in Scotland were inferior to those in the Malay States. He (Sir A. Sinclair) was incredulous, but this doctor's opinion was not inconsistent with the stern and sombre warnings addressed to the local authorities in the report of the Department of Health. At the present moment there was no more serious need under the heading of public health in the Highlands of Scotland than an increase in the water-supply. He impressed on the Government the vital importance of that cardinal requirement.

Sir IAN MACPHERSON, in regard to the Highlands and Islands Medical Service, said that it was not economy and had not been the original intention to transport patients from the islands to a central hospital, while he disagreed with Sir A. Sinclair in regard to the superiority of hospitals in Malay over those in Scotland.

Sir CHARLES MACANDREW, on the question of maternal mortality in the report of the Department of Health, said:

> "The total number of midwives enrolled by the Central Midwives Board for Scotland since the roll was established in 1915 up to the 31st March, 1934, was 11,002, of whom 7440 were enrolled after passing the Board's examination."

That perhaps might account for the rate of maternal mortality. It seemed extraordinary that over 3500 midwives who could not pass the examination should be on the roll. Midwives who could not pass the examination, but who were nevertheless on the roll, might do enormous damage to health in Scotland. Referring to venereal diseases the report said:

> "In the absence of any system of notification the incidence of venereal diseases in the country is unknown."

It might be that legislation was required to make it notifiable. The report said:

> "Infected mothers often show great anxiety for the health of their children and bring them willingly to the centres for observation, and for treatment if necessary. In one or two areas, also, infected parents have been persuaded to allow their children to be admitted to hospital for intensive observation."

Was it not possible to make it compulsory for doctors to notify these cases? Then there was the question of the teeth of the children. The dental staffs consisted of 48 whole-time and 35 part-time dentists, and the report said:

> "It is very doubtful whether the existing dental staffs can adequately supervise the condition of the teeth of the children, especially since much of their time is occupied in attending to casual cases, that is, children suffering from tooth-ache whose teeth may be beyond saving."

If a little of the money which ought to be saved on other things could be devoted to the dental service it would be of great benefit to the children. It was most regrettable to learn that at this age the teeth of many children were beyond saving. Anyone who had had an opportunity of seeing the holiday camps must be aware that the sanitary conditions were anything but satisfactory. He suggested that it might be a desirable thing if some of the medical officers attached to territorial units were allowed to inspect these holiday camps because they had much more experience of camps than the officials of the Department of Health.

Mr. MAXTON said that he was interested to know that the number of persons who had to apply for poor relief per thousand of the population in Scotland in 1934 was precisely the same proportion as had to apply in 1867. That was rather a distressing figure. It showed that over a period of 70 years there had been no substantial change made in the ratio of very poor people to the total population. He also found that the cost in one district of maintaining the poor in poor-law institutions—the sick poor, the able-bodied poor, and the insane poor—fell as low as 5s. a week. That was an appalling figure. Above that figure of 5s. a week there were all sorts of variations. He was sure that for the money that it had cost to keep poor people in poor-law institutions in Scotland in general there could not be inside those institutions the amenities of life that were certainly made possible by the Scottish Poor Law Act which was recently passed. He hoped the Government would inquire whether the local authorities were in fact operating the new Poor Law Act in the way that he believed and hoped that it would be operated.

Dr. G. A. MORRISON raised the question of the reports of the medical officers of schools with reference to the large number of children who on coming to school were found to be suffering from easily remediable defects. The inspectors of the English Board of Education used this as one of the strongest arguments for the institution of more nursery schools, especially in the large cities. His wife, in connexion with her experience in a girls' club in Aberdeen, had been struck by the number of girls of 17 and 18 years who had very bad teeth, and in some cases almost no teeth at all. The gap between the time when boys and girls received skilled dental attention at school and the time when they were due to receive dental benefit from some approved society would be to some extent closed if there was an extension of the provision of dental attention to the junior instruction centres.

Mr. SKELTON, replying to points raised in the debate, said the question of the provision of hospitals, which had been mentioned by Sir A. Sinclair, was one on which the Government could not interfere with the local authorities. The 1929 Act increased facilities for proper hospital accommodation by making it easier for local authorities to combine for the purpose of hospital building and maintenance. He regretted to say that it had not always been taken advantage of, and while he agreed that progress had been slow, he did not propose to relax pressure on local authorities to get on with the work of hospital accommodation wherever it was insufficient. He entirely agreed with the observations in the report of the department that much required to be done before the matter could be regarded as satisfactory, and that would be borne out, he thought, by the maternal mortality report, but under existing legislation, apart from exerting pressure on local authorities, there were no substantive steps which the Secretary of State or he could take on this topic of the supply of hospitals. He could assure the committee that the Government would not forget the question of Highland water-supplies. In regard to the employment of unqualified midwives, it was not possible to apply the provisions of the last Act to persons who were midwives when the Act came into operation. The question of dental service again was primarily a matter for the local authorities. With regard to camps and their sanitation, local authorities already had considerable powers in making by-laws for the control of such camps.

Further discussion of the Note was adjourned.

Voluntary Hospitals (Paying Patients) Bill

The Voluntary Hospitals (Paying Patients) Bill and the St. Bartholomew's Hospital Bill were brought down from the House of Lords and read a first time in the House of Commons on Monday July 1st.

University of Durham Bill

In the House of Lords on Tuesday, July 2nd, the University of Durham Bill was read the third time and passed.

Housing (Scotland) Bill

The Housing (Scotland) Bill passed the Report stage in the House of Commons on Tuesday, July 2nd. The Public Health (Water and Sewerage) (Scotland) Bill and the Criminal Lunatics (Scotland) Bill were read a second time.

HOUSE OF COMMONS

THURSDAY, JUNE 27TH

Workmen's Compensation Inquiry

Mr. TOM SMITH asked the Home Secretary if he was in a position to make a statement with regard to the inquiry taking place into the working of the Workmen's Compensation Act.—Sir JOHN SIMON replied: A general inquiry into every aspect of the working of the Workmen's Compensation Act would be a large undertaking, which would take up much time, but I have been considering whether there are not some specific questions which could be more speedily examined, and I hope it may be possible to make a statement on the subject very shortly.

Mr. Smith: Will the right hon. gentleman keep in mind the specific question which was sent to his predecessor by the Miners' Federation of Great Britain relating to a legal decision with regard to miners' nystagmus?

Sir J. Simon: One of the specific matters which I had in mind when I gave my answer was the case of miners' nystagmus.

Physical Training in Schools

Mr. Hall-Caine asked the President of the Board of Education in what approximate proportion of primary and secondary schools, respectively, at the present time, physical training was carried out in special costumes as opposed to the ordinary clothes of the pupils; and in what proportion the physical training of boys was superintended by male instructors.—Mr. Stanley replied: I regret that the information in my possession does not enable me to reply to the first part of the question. The provision of special costumes for physical training is encouraged by the Board and is becoming more general. I have no information as to the proportion of schools in which boys are taught by male instructors. In elementary schools the instruction is given by the class-teachers, who in the case of senior boys' departments would be men; in boys' secondary schools there is generally a male instructor on the staff.

Care of Deaf Persons

Mr. Hutchison asked the Minister of Health whether he proposed to introduce or give facilities for a Bill dealing with the disability of deafness; and whether he was satisfied with the adequacy of present arrangements for the care of such persons.—Sir Kingsley Wood replied: I am not at present satisfied that special legislation on this subject is necessary. My hon. friend is no doubt aware of the report prepared by the late Dr. Eichholz on the condition of the deaf. That report did not recommend any further legislation, but advocated certain measures which were commended to local authorities in a circular issued by my department in May, 1933. The Ministry are continuing to impress on local authorities the importance of giving financial assistance, where necessary, to those voluntary agencies which are doing valuable work in finding suitable employment for deaf-and-dumb persons.

Mortgage of Insurance Medical Practices

Mr. Logan asked the Minister of Health if he was aware of the mortgaging and transfer of medical practices in connexion with panel patients controlled by financial houses; and if he was prepared to investigate this matter.—Sir Kingsley Wood replied: My attention has been drawn to arrangements by which medical practitioners are able to obtain loans on the security of their income from insurance practice; but in the absence of specific evidence that these arrangements are exercising a prejudicial effect on the insurance service, I do not think this is a matter in which it would be proper for me to intervene.

Mr. Logan: Is the right hon. gentleman aware that I did send him a press cutting in which definite statements were made and will be make investigations into this matter?

Sir K. Wood: It is difficult for me to begin to examine statements in the press. If the hon. Member has any particular facts of his own knowledge I shall be glad to have a talk with him about them.

Mr. Rhys Davies: Will the right hon. gentleman be good enough to look at the report sent to his predecessor by the Association of Insurance Committees on this subject?

Sir Francis Fremantle: Is it not a fact that patients always have a choice of doctor and therefore they cannot be sold except from the point of view of goodwill and subject to the wish of the patients?

Cost of Milk to Hospitals

Mr. Graham White asked the Minister of Agriculture if any estimate had been made of the additional cost of milk to voluntary and other hospitals since the Milk Marketing Board was instituted; and if the Board and/or the Government proposed to take any action to relieve the hospitals of this additional burden.—Mr. Elliot replied: I would refer the hon. Member to the replies I gave on May 2nd, to which at the moment I have nothing to add.

Mr. T. Williams: Will the right hon. gentleman make representations to the Milk Marketing Board on the question of granting hospitals and such institutions treatment similar to that received by ice-cream vendors?

Mr. Elliot: It is difficult to suggest that a certain class of individuals should bear the loss on the supply to hospitals unless it is suggested by the people who supply hospitals.

Mr. Williams: Is the right hon. gentleman aware that the consumers and the producers as the case may be are really bearing a large loss on milk sold to ice-cream vendors?

No answer was given.

Child Labour in the Fields

Mr. Burnett asked the Secretary of State for Scotland how many local authorities used the powers given to them under the Children and Young Persons (Scotland) Act, 1932, to restrict or prohibit child labour in the fields.—Mr. Skelton, Under-Secretary of State for Scotland, replied: No education authority in Scotland has taken power by by-law, under the Act mentioned, to prohibit entirely the employment of children in agricultural pursuits. In five areas the statutory minimum age for employment of 12 years has been raised by by-law to 13 years for all employment, including agricultural work, though in one of these areas the higher age limit applies only to girls. Thirty-three of the 35 education authorities have made by-laws as to the employment of children, and in each case the by-laws include provisions for regulating the hours and conditions on which children may be employed.

MONDAY, JULY 1ST

National Health Insurance Appeal

Mr. Lunn asked the Minister of Health whether he would give the reason for the delay in not setting down for appeal to the High Court the case of Mrs. K. Slaughter, of 112, Brentwood-road, Romford, Essex, against the decision of the referee appointed under Section 90 of the National Health Insurance Act, 1924.—Mr. Shakespeare, Parliamentary Secretary to the Ministry of Health, replied: The Referee appointed under Section 90 of the National Health Insurance Act, 1924, acceded to the request of Mrs. Slaughter to state a case for the decision of the High Court on a question of law. There has been some unavoidable delay but my right hon. friend is informed that the terms of the case have now been settled and signed by the Referee and forwarded to Mrs. Slaughter's solicitors, who are, therefore, now in a position to set down the case for hearing.

Lung Trouble among Barytes Miners

Mr. Duckworth asked the Secretary for Mines whether his attention had been drawn to the frequent occurrence of lung trouble among barytes miners and quarrymen in the Minsterley and Pontesbury district of Shropshire, and in particular to the death from silicosis of John Richards, of 9, Top-road, Pontesbury Hill, on May 21st; whether His Majesty's inspectors of mines had inspected and reported upon the conditions under which work was carried on; and whether he was satisfied that every possible precaution was being taken to safeguard the workers from this danger.—Captain Crookshank replied: I have received no information of cases of industrial pulmonary disease in this district except at one barytes mine: and at this mine proper precautions are being taken following a thorough inspection of the conditions by H.M. Inspectors of Mines. The case of John Richards has not previously been brought to my notice and I am having it investigated.

Accidents in the Building Trade

Mr. JOEL asked the Home Secretary whether any information had been laid before his department to show that accidents in the building trade were increasing; and whether insurance companies were now making exhaustive inquiries as to the cause.—Sir J. SIMON replied: If the figures for the last five years be compared there would not appear to be any material change in the proportion of accidents in this trade, and I am advised that the increase in 1934 over 1933 may be fully accounted for by increased building activity and by better reporting of accidents to the need for which the special attention of employers was recently drawn. It has, however, been recognised by my department for some time past that the situation calls for further inquiry and I have just appointed Mr. G. S. Taylor, Deputy Chief Inspector of Factories, specially assisted by three other inspectors, to make a report, after consultation with bodies concerned and after any necessary inquiries, reviewing the accident risks in the building industry and the precautions already adopted, whether by way of regulations or otherwise, with a view to advising as to what further measures may be desirable.

Infection of Workers Due to Paint Spraying

Mr. JOEL asked the Home Secretary if the information in his department showed that there was any increase in infection of workers due to paint spraying.—Sir JOHN SIMON replied: I have no information indicating any increase of illness from this cause.

Accidents Due to Electrical Apparatus in Private Houses

Mr. TEMPLE MORRIS asked the Home Secretary how many fatal accidents there were during 1934 from the use of electrical apparatus in private houses; and whether he was satisfied that existing legislation was sufficient to prevent the sale of articles which could not be used with safety by inexperienced persons.—Sir JOHN SIMON replied: Accidents from the use of electrical apparatus in domestic premises are not reportable to the Home Office, but fifteen fatal accidents of this kind came to the notice of the department during 1934. The law does not prohibit the sale of electrical appliances on the ground that they may be dangerous to inexperienced persons, but only a few instances have come to the notice of the department in which exception could reasonably be taken, on grounds of danger, to electrical apparatus placed on sale, and in such cases manufacturers generally have shown themselves ready to remedy the defects, when pointed out to them.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A course in urology will be given at the All Saints' Hospital from July 8th to 27th; it will occupy the afternoons and evenings with clinical and cystoscopic demonstrations. A week-end course in general medicine and surgery is to be held at the Southend General Hospital on July 13th and 14th, and an afternoon course in Dermatology at the Blackfriars Skin Hospital from the 15th to 27th. A panel of teachers who are prepared to give clinical instruction at their in-patient and out-patient clinics is prepared by the Fellowship. Particulars may be had from the Secretary at 1 Wimpole Street, London, W.1.

WESTMINSTER HOSPITAL.—On June 26th the Prince of Wales laid the foundation-stone of the nurses' home which is to be the first building of the new Westminster Hospital. As recounted in our issue of June 22nd, the new building is to be erected on the west side of St. John's Garden's, not far from Lambeth Bridge, and will accommodate 40 sisters, 200 nurses, 15 pupils undergoing preliminary training, and 50 domestic staff. It was announced that Mr. Myerstein has presented a cheque for £10,000 for the medical school building.

BRITISH POSTGRADUATE MEDICAL SCHOOL

THE FIRST REFRESHER COURSE

A COLLECTION of practitioners of different ages and widely varying experience assembled for the first intensive refresher course held at the British Postgraduate Medical School from June 17th to 29th, only a month after the school was formally opened. The staff of the school was supplemented on this occasion, and will be also in the future courses, by outside specialists, this time represented by Dr. C. W. Buckley, Dr. L. S. T. Burrell, Dr. E. Mapother, and Dr. J. A. Ryle. The sessions on each day were from 10.30 A.M. to 1 P.M., and 2 to 4.30 P.M., with fifteen minute intervals in the course of each morning and afternoon.

FIRST WEEK

Dr. F. R. Fraser, professor of medicine, welcomed the students with what was described by one of them as a "really refreshing preamble which justified the title of the course." He spoke sympathetically of their common experience of the many psychological problems which block the way to success in many cases which should be curable. The part played by psychic trauma in general structural disease is, he holds, a major one. The practitioner has it in his power to increase the health and happiness of mankind and to treat the individual (not the mass) to be better fitted for his environment. He must remember that the governing motive that takes the patient to the doctor is fear—fear in relation to his life or to his efficiency. It is prognosis that he wants, and this necessarily implies diagnosis, not merely anatomical diagnosis, but a realisation of the actual disease process and the stage it has reached. Prof. Fraser discussed the determination of the data involved and emphasised the value of history-taking as against mere physical examination. Whilst history-taking is subjective and symptomatic, physical examination is objective and structural. The majority of medical out-patients have no objective physical signs, but if they have it is criminal to miss them. The patient must be investigated as a biological entity in order to discover his environment, and the cause of his possible misfit in life. In the elaboration of this detective game questions on past health rather than on the more familiar past illnesses are important—e.g., "did you play games?" Two case-histories were detailed, one of a clergyman and the other of a girl clerk, to illustrate the importance of digging out the psychological basis of disease in spite of an apparently obvious anatomical diagnosis. Prof. Fraser doubted, rather wickedly, if Harley-street could live, given on the part of each medical practitioner the gift for good history-taking and a more highly developed faculty for using the eyes.

With these encouraging words, which established a friendly understanding, Prof. Fraser passed on to a demonstration of his own methods of physical examination on a variety of interesting cases.

In the afternoon Dr. Burrell followed with a rapid but fairly exhaustive survey of the main problems of pulmonary tuberculosis. Among the lessons to be drawn from his teaching were that in diagnosis symptoms are more reliable pointers than physical signs, which may be absent; that a differential leucocyte count and an estimation of erythrocyte sedimentation-rate may have prognostic significance;

and that senile tuberculosis is far more common than is generally believed. He discussed treatment at the stage of attack, at the stage of defence, and when the patient is discharged from a sanatorium, giving indications for and against the various modern surgical measures.

The next day was devoted to visits in the morning to the Central London Throat, Nose and Ear Hospital, and in the afternoon to the London School of Dermatology, St. John's Hospital for Diseases of the Skin.

Wednesday was given up to a symposium on gastric ulcer. Dr. Ryle started with a lecture on the natural history of peptic ulcer, the commonest organic cause of dyspepsia in males and a prominent cause of sick-wastage. Duodenal ulcer alone supplies 1 per cent. of admissions to a large general hospital. Many more are treated as out-patients, still others do not come to hospital, and many escape diagnosis. It is a disease with low mortality, but deaths in this country in 1930 are twice the numbers of those for 1920. Owing to lack of physical signs and other causes, diagnosis is commonly missed or delayed, and the spontaneously relapsing course of duodenal ulcer with long free periods is also a reason for missed diagnosis. In a long series of cases the average duration of a duodenal ulcer prior to diagnosis was seven years. The precise mode of causation remains obscure. The symptomatology of duodenal and gastric ulcer and their complications were discussed. Prognosis depends on age or stage of ulcer, age and occupation of patient, and presence or absence of complications. In assessing the choice and prospects of treatment length of history is especially valuable. The earlier the diagnosis the better the prospects of medical relief. After this lecture demonstrations were given of pathological specimens by Prof. E. H. Kettle, of patients by Dr. Ryle, and of the tests for occult blood in stools by Mr. E. J. King, D.Sc. After lunch Dr. Duncan White gave a lecture-demonstration on the place of radiology in the diagnosis and management of peptic ulcer, and Dr. Ryle discussed the functional dyspepsias and their differentiation from ulcer dyspepsia, and detailed the treatment of peptic ulcer with a demonstration of diets during the first month of treatment.

On Thursday morning Dr. Janet Vaughan explained the differential diagnosis and treatment of common types of anæmias. She classified the anæmias on an ætiological basis, detailed the essential hæmopoietic factors, and described the out-patient diagnosis of deficiency anæmias by a combination of clinical and laboratory methods. The fact that the response of deficiency anæmias to treatment is specific was emphasised and the possible presence of a dual deficiency in certain cases discussed. While iron must be given by the mouth, deficiency of the pernicious anæmia (P.A.) factor is most effectively and cheaply dealt with by parenteral therapy. In the afternoon Sir Frederick Banting lectured on the history of insulin and Prof. J. Young gave a demonstration of obstetrical cases.

On Friday Prof. Young, in the course of a lecture on antenatal examination, pointed out that 10 per cent. of maternal mortality is due to ante-partum hæmorrhage, and 18 per cent. of maternal mortality is, in normal cases, due to sepsis. Morning sickness might be attributable to night starvation. If it was very severe salines per rectum brought relief. In the afternoon Dr. Chassar Moir discussed some common gynæcological conditions, showing cases of prolapse and of dysmenorrhœa. He pointed out the importance of preventing a mother from being over-sympathetic with a girl suffering from dysmenorrhœa. In his experience glandular preparations had been of little help in such cases, but in severe cases of dysmenorrhœa unrelieved by other methods a presacral sympathectomy had proved successful.

On Saturday Dr. Mapother, speaking on psychiatry in general practice, showed cases to illustrate the association between arterio-sclerosis and mental disorder. He dealt also with the differential diagnosis of neurosis and psychosis, pointing out that in neurosis the patient is not detrimental to others and has insight into his condition.

SECOND WEEK

Prof. G. Grey Turner started the second week with a lecture on gastric carcinoma, its diagnosis and treatment. He emphasised the importance of repeated clinical examinations, test-meals, and examinations of vomit for blood. The mortality of gastrectomy was 10 per cent.; when there was probability of gastric carcinoma, the risk of abdominal exploration was less than the risk of delay. Prof. Grey Turner detailed the operative treatment and Dr. Duncan White demonstrated X rays of the condition.

In the afternoon Prof. Fraser lectured on heart disease and heart failure, its diagnosis, treatment, and prognosis. Tuesday was spent profitably at the Hospital for Sick Children, Great Ormond-street. On Wednesday Dr. Buckley lectured on chronic arthritis of the rheumatoid and osteo-arthritic types, showing the pathological, and, with Dr. White's help, the radiological features peculiar to each type, and in the afternoon spoke of the chronic rheumatic affections, notably sciatica (trunk, root, and referred); spondylitis (ankylosis and osteo-arthritic), and lumbago. On Thursday Dr. J. G. Scadding dealt with some common respiratory diseases, devoting most time to bronchiectasis and pulmonary suppuration and to asthma. In the afternoon Mr. Lambert Rogers, speaking on fractures, drew attention to a general simplification in methods of treatment. The multitude of splints formerly in use had disappeared and plaster-of-Paris was increasingly popular. There was also a decline in operative treatment, except in certain fractures, and a tendency towards longer periods of immobilisation. Next morning Mr. Lambert Rogers lectured on head injuries and in the afternoon Prof. Grey Turner gave an address on the diagnosis of acute abdominal conditions, showing how acute appendicitis in its different forms (without peritonitis, with local peritonitis, with flank or pelvic peritonitis or both, and with residual abscess,) could be differentiated from acute gall-bladder, perforation of gastric or duodenal ulcer, and intestinal obstruction. On the last day of the course a demonstration of local anæsthesia was given and the members of the class were given an opportunity for making critical and constructive suggestions on the requirements of a refresher course of this kind.

CONCLUSION

The first venture of this new school was accounted a real success. The brief impressions noted above were collected from various members of the class and are not a balanced summary of the salient features but an indication of the practical nature of the instruction provided. The course coincided with a spell of hot weather and arrangements had not yet been made for electric fans or other devices to mitigate the heat in the lecture theatres. The disadvantage of having these in close proximity to the hospital was sometimes apparent, since noises from the out-patient department and from patients' friends on visiting days were occasionally disconcerting

On the other hand, the fittings of the demonstration theatre, the excellent epidiascope, and the arrangement whereby the lecturer can communicate by microphone with the technician outside the theatre who is showing his slides were most convenient. The school has made a good start with these short pithy courses. We understand that the later ones to be held from July 15th to 27th, Sept. 16th to 28th, and Nov. 18th to 29th have been planned on much the same lines.

MEDICAL NEWS

University of Oxford

At recent examinations the following candidates were successful :—

Materia Medica and Pharmacology.—E. J. S. Barthorpe, R. Billig, R. G. Blackledge, L. B. Bok, J. F. Bourdillon, T. N. Branch, R. C. Browne, F. G. Ethiraj, A. W. Frankland, T. Gadian, W. M. Gibson, S. R. Gloyne, N. J. S. Gurney, J. C. Hewetson, J. R. Hollick, R. M. Hugo, A. M. L. Isabella, E. L. James, P. R. W. Leigh, J. N. Mills, R. G. W. Ollerenshaw, H. G. O. Owen-Smith, J. A. Partridge, C. W. R. Rayne-Davis, I. F. Rose, T. B. Snell, N. E. Stidolph, S. F. Taylor, G. J. Walley, J. Walter, C. M. F. Walters, D. Whitteridge, W. Wynne Willson, and W. B. Young.

Pathology.—W. D. Brinton, R. C. Browne, W. W. Coppinger, P. S. Edgecombe, A. F. Foster-Carter, D. B. Fraser, W. E. Gibb, S. R. Gloyne, C. F. Hamilton-Turner, G. F. C. Hawkins, J. C. Hewetson, J. H. Lewis, N. H. Martin, H. Muller, C. I. Murphie, T. E. Ooi, H. M. Sinclair, D. H. Swayne, R. Y. Taylor, A. L. Watson, and A. L. Young.

Forensic Medicine and Public Health.—P. C. Alexander, W. J. C. Anstie, D. R. Balcombe-Brown, P. S. Buckley, M. C. Chapman, H. N. Davis, H. Fidler, W. E. Henley, G. A. Hodgson, J. R. Hollick, J. F. Loutit, W. P. Mallinson, A. P. Meiklejohn, R. Passmore, F. R. P. Pepper, H. Rees, and F. G. Ward.

Medicine, Surgery, and Midwifery.—W. J. C. Anstie, N. E. R. Archer, R. Bevan, P. G. Burgess, H. Burton, M. C. Chapman, C. D. Coode, P. E. Cresswell, K. B. Dawson, C. F. Hamilton-Turner, W. E. Henley, D. H. Hertz, J. R. Hollick, C. Hollins, N. Leitch, A. P. Meiklejohn, D. F. G. Moir, J. C. Penton, T. W. H. Porter, K. C. Royes, W. R. Trotter, and J. W. A. Turner.

University of Cambridge

On June 22nd the following degrees were conferred :—

M.D.—R. A. Ratcliff and F. J. Wright.
M.Chir.—R. J. V. Battle.
M.B. and B.Chir.—C. J. G. White.
M.B.—W. H. Gabb.
B.Chir.—W. S. Haynes.

University of Durham

On June 27th the honorary degree of doctor of civil law was conferred on Prof. Thomas Beattie and the honorary degree of doctor of surgery (D.Ch.) on Prof. G. Grey Turner. Ordinary degrees and diplomas were conferred as follows :

M.D.—E. Browell, G. Davison, W. Foskett, J. J. H. Lowe, F. McGuckin, G. M. Miller, J. A. Stobbs, F. H. Taylor.

M.D.S.—A. D. Hitchin.

M.B. and B.S.—B. M. Axton, C. Bainbridge, H. H. S. Brown, J. Cleminson, T. A. Cockburn, W. Cowell, R. J. Crompton, H. R. Dewar, A. K. Dougall, W. Dunn, H. Fabricant, J. F. Fraser, V. E. Gillis, N. D. Gofton, W. F. Hall, J. G. H. Harbinson, T. E. Henderson, J. R. Heslop, N. Q. Hesse, T. F. Hird, A. S. Jarman, H. L. Jenkins, D. C. Morris, A. H. G. Munro, L. H. Murray, A. E. Paxton, D. Reemer, K. D. Rosner, R. J. Rutherford, M. Salpeter, G. H. Scott, J. N. Swainston, J. Swinney, J. V. Todd, H. Weiss, G. H. Whalley, and S. Woolf.

B.Hy.—J. Angus, D. S. Buchanan, and N. V. Hepple.

D.P.H.—J. Angus, D. S. Buchanan, and N. V. Hepple.

L.D.S.—L. R. Bowlby, A. S. Douglas, R. M. Stephenson, and C. J. Thubron.

University of Glasgow

Mr. John Adam Gib Burton has been appointed to succeed Prof. Peter Paterson in the St. Mungo chair of surgery in the university.

Mr. Burton, who is surgeon to the Glasgow Royal Infirmary, graduated at Glasgow in 1909, and saw active service during the late war in France, Gallipoli, and Mesopotamia, receiving the Military Cross. He was formerly lecturer in pathology, but subsequently became Prof. Paterson's senior assistant, and is at present hon. lecturer in clinical surgery in the university.

On June 28th the following degrees were conferred :—

D.Sc.—Tudor Jenkyn Jones, M.B.

M.D.—John Wyllie (with high commendation), J. L. Dunlop (with commendation), and A. F. R. Dewar (in absentia).

A Congress on Gout

From Sept. 14th to 16th a conference will be held at Vittel, in France, on the subject of gout and uric acid. Those taking part will include Prof. Loeper, Prof. Fiessinger, Prof. Rathery, Prof. Marcel Labbé, Prof. Villaret, Prof. Étienne, Prof. Santenoise, Dr. M. P. Weil, Prof. Pasteur-Vallery-Radot, and Dr. A. P. Cawadias. The foreign committee includes (in this country) Dr. Cawadias and Sir William Willcox. Particulars may be had from Dr. M. Boigey, secrétaire général du Congrès de la Goutte, Vittel, Vosges.

University of Edinburgh

On June 28th the honorary degree of doctor of laws was conferred on Surg. Commander J. D. Pollock.

The degree of Ph.D. was also conferred on Dr. Munir El Gazayerli.

University of St. Andrews

The honorary degree of LL.D. has been conferred on Dr. C. H. Browning, F.R.S., Gardiner professor of bacteriology in the University of Glasgow, and Sir John Boyd Orr, M D., F.R.S., director of the Rowett Institute for Research in Animal Nutrition, Aberdeen.

Middlesex Hospital Medical School

The council of the Middlesex Hospital medical school has decided to celebrate the hundredth anniversary of the foundation of the medical school on Wednesday, July 24th. In the afternoon the prizes and medals won during the session 1934–35 will be presented to students by the Chancellor of the University of London, and on the same date there will be a scientific evening. Both ceremonies will be held at the Middlesex Hospital. The students' centenary ball will take place at the Dorchester Hotel on the evening of July 25th. The "refresher course" and annual dinner will be held as usual during the last few days of September and early in October respectively.

Tribute to Mr. Webb-Johnson

On June 27th Mr. A. E. Webb-Johnson, F.R.C.S., surgeon to the Middlesex Hospital, was entertained to dinner at Claridges Hotel by members of the hospital board, medical staff, and medical school. The dinner was given on the completion of the new Middlesex Hospital, to show appreciation of Mr. Webb-Johnson's work during the past ten years. He has been chairman of the plans committee from the beginning and has, it is stated, been responsible, directly and indirectly, for raising £500,000 of the £1,250,000 which the scheme has cost.

Metropolitan Water Board

Dr. Donald Craig Norris, F.R.C.S., deputy medical officer of the Bank of England, has been appointed chief medical officer of the Metropolitan Water Board in succession to the late Sir John Collie.

Hertford Hospital, Paris

An English resident in Paris has offered to give £1360 towards the special fund for alterations and additions to this hospital, provided three others will give the same. It was founded and endowed by Sir Richard Wallace for the treatment of poor British subjects and was opened in 1879. Until 1920 nobody was asked to contribute to the funds, but the drop in the exchange value has made it necessary to appeal for help.

Hospital of St. John of Jerusalem

The King has sanctioned the following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem :—Knights of Grace : Lt. Col. Sir Louis E. Barnett, Dr. I. G. Modlin, Major J. Orton. Commanders : Dr. W. G. Rogers, Surg. Lt.-Col. E. J. H. Luxmoore, Lt.-Col. G. E. Peacock, S. S. Pringle, P.R.C.S.I., Dr. Ian Fraser. Officers : Dr. C. H. Perram, Dr. H. L. Garson, Dr. H. R. Richard, Dr. O. G. Ingham, Dr. H. F. Munro, Dr. W. O. Gliddon, Dr. W. C. Winfrey, Dr. J. J. Danby, Dr. D. Samuel (since decd.), Major S. R. Gibbs, R. V. de A. Redwood, Col. C. R. White, Mrs. J. W. MacInnes, M.B. Serving Brothers : Dr. L. H. Wharton, Major S. Copley, Dr. C. H. Upham, Dr. P. C. Davie, Dr. A. E. A. Palmer, Dr. H. Riddell, Capt. R. H. Hadfield, Col. H. H. E. Russell, Dr. O. H. Hudson, Dr. A. J. Hopper, Dr. W. A. Jones, Dr. S. C. Bettencourt-Gomes, Dr. F. F. A. Ulrich, Dr. J. A. Carman, Dr. J. E. Brereton, Dr. H. B. Pierce.

British Social Hygiene Council

The seventh Imperial Social Hygiene Congress, under the ægis of various Government departments, will be held at the London School of Hygiene and Tropical Medicine on July 8th–12th. The Congress has been organised by the British Social Hygiene Council. Delegates, including many from overseas countries of the Empire, will be welcomed by the Earl of Plymouth, Sir Basil Blackett (president of the Congress), Sir Edward Grigg, and the High Commissioners of Australia, India, the Irish Free State, New Zealand and Southern Rhodesia.

Among matters to be discussed are: Domestic Relations and Matrimonial Cases; the Traffic in Women; the Juvenile Delinquent; Parents and Biology Teaching; Biology Teaching to Boys and Girls; Effects of Biology Teaching in the Colonies. A Conference on the Welfare of the Mercantile Marine will be held on the afternoon of Monday, July 8th.

Mental Hospitals Association

The seventeenth annual meeting of this association will be held at the Guildhall, London, on Wednesday next, July 10th, at 11 A.M.

Extensions at Mile End Hospital

A new out-patients' department and the balconies to the female ward block were opened last week at Mile End Hospital by Mr. Dan Frankel. The new balconies will take ten beds on each floor and have been fitted with the folding type of steel window.

Nottingham General Clinic

A fracture clinic is to be established at this hospital in order to control, unify, and continue the out-patient treatment of all fracture cases and follow its results. The sum of £36,750 has been received towards the £50,000 required for the erection of this wing.

Births, Marriages, and Deaths

BIRTHS

BRAYBROOKE.—On June 25th, at Tetbury, the wife of M. K. Braybrooke, M.R.C.S. Eng., of a son.

BUIST.—On June 27th, at Glasgow, the wife of Major T. P. Buist, M.B., Ch.B. St. And., R.A.M.C., of a daughter.

CHANDLER.—On June 26th, at Sunningdale, the wife of G. P. Chandler, M.D. Camb., of a daughter.

FOX.—On July 1st, at Hampstead, to Margaret and T. F. Fox—a son.

FRESHMAN.—On June 30th, at Welbeck-street, W., the wife of Edgar Freshman, F.R.C.S., of a daughter.

LEARMONT.—On June 19th, at Hovingham, York, the wife of Alan A. Learmont, M.B., Ch.B. Edin., of a son.

NEWBERY.—On June 21st, at Royal Naval Hospital, Haslar, the wife of Surgeon Lt.-Commdr. D. A. Newbery, R.N., of a daughter.

ORMEROD.—On June 21st, at Woodford Green, the wife of Thomas L. Ormerod, M.B., B.Ch. Oxon., of a daughter.

PILCHER.—On June 22nd, at Boston, Lincs, the wife of Richard Pilcher, F.R.C.S. Edin., of a daughter.

ROCHE.—On June 23rd, at Knaresborough-place, S.W., the wife of Alex. E. Roche, M.D. Camb., F.R.C.S. Eng., of a son.

ROSS.—On May 31st, at Ranikhet, India, the wife of Captain W. A. R. Ross, M.B., Ch.B. Edin., R.A.M.C., of a son.

SCHOLEFIELD.—On June 22nd, at Hereford, the wife of Bernard Scholefield, M.D. Oxon., F.R.C.S. Eng., of a daughter.

SEWELL.—On June 25th, at Sutton Scotney, Hants, the wife of Capt. E. M. Sewell, M.B., Ch.B. Edin., I.M.S., of a son.

MARRIAGES

CORCORAN—HAY.—On June 29th, at the Church of St. Joseph, Bedford, Capt. Thomas Martin Corcoran, M.R.C.S. Eng., R.A.M.C., to Elizabeth Maud, daughter of Col. W. N. Hay, C.I.E., D.S.O., and Mrs. Hay, of Bedford.

FARQUHARSON—HALLAM.—On June 21st, at St. Mary Abbots Church [illegible] A. Farquharson, M.B., C.M. Edin., [illegible] I., late of Darjeeling, to Agnes Mary, [illegible] late Mr. Henry Hallam, of Nottingham.

DEATHS

CLEMINSON.—On June 30th, at North Ferriby, Florence Stacey Cleminson, J.P., M.B., B.S.

GELLATLY.—On June 30th, at Cambridge, Jessie Handyside Gellatly, M.D., D.P.H. Edin., aged 52.

HEARDER.—On June 23rd, at Dinas Powis, Frederic Pollington Hearder, M.D. Edin., aged 62.

KITCHIN.—On June 28th, at Canford Cliffs, Bournemouth, Ernest Hugh Kitchin, M.B., B.Chir. Camb., aged 60.

MCALLUM.—On June 22nd, at Inglewood, New Zealand, Harold Guthrie McAllum, M.B., B.S. Durh., fifth son of the late Charles Octavius McAllum, of Newcastle-on-Tyne, aged 62.

MORTON.—On June 27th, at Lavender-gardens, S.W., Thomas Mahon Morton, L.R.C.P.I., L.R.C.S.I., aged 69.

RIDDELL.—On June 29th, at Beechwood, Bearsden, James Robertson Riddell, F.R.F.P.S. Glasg.

SCOTT.—On June 28th, at Charmouth, Dorset, Geoffery Easton Scott, B.M., B.Ch. Oxon., M.R.C.S. Eng., aged 26.

SMITH.—On June 28th, at Leatherhead, suddenly, Harry Edward Smith, M.B., B.Chir. Camb.

SUCKLING.—On the 30th ult., at "Beech Lawn," Edgbaston, Birmingham, Cornelius William, M.D., London, aged 80 years. Interred at Sutton Coldfield Cemetery, July 3rd.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Appointments

BROWN, W. PATERSON, M.B. Glasg., D.P.M., has been appointed Medical Director of the North Western Child Guidance Clinic, London.

DUFF, KEITH, F.R.C.S. Eng., M.C.O.G., Gynæcologist to the Dreadnought Hospital, Greenwich.

HILL, I. G. W., M.B., F.R.C.P. Edin., Clinical Tutor, Aberdeen Royal Infirmary.

LAMB, W. L., M.B., F.R.C.P. Edin., Clinical Tutor, Aberdeen Royal Infirmary.

MCNAIR, J. S., M.B. Glasg., Medical Superintendent of the Hospital for Tropical Diseases, London.

MORGAN, T. N., M.D. Aberd., Clinical Tutor, Aberdeen Royal Infirmary.

MORTON, H. S., M.B. Lond., F.R.C.S., First Assistant in the Gynæcological and Obstetric Department, London Hospital.

Certifying Surgeon under the Factory and Workshop Acts: Dr. J. D. Jones (Llanberis, Caernarvon).

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday; and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

SOCIETY FOR THE STUDY OF INEBRIETY.
TUESDAY, July 9th.—4 P.M. (11, Chandos-street, W.), Dr. William Brown: Psychology in Relation to Alcohol and Drug Addiction (Presidential Address). Dr. S. W. Patterson: Addiction to Endocrine Gland Extracts.

PADDINGTON MEDICAL SOCIETY.
TUESDAY, July 9th.—9 P.M. (at Great Western Royal Hotel, Paddington, W.), Dr. Alfred Welply: The Medical Practitioners' Union and the Trades Union Congress.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, July 12th.—5.15 P.M. (at West London Hospital), Annual General Meeting.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, July 8th, to SATURDAY.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. All-day course in medicine, surgery, and the specialties.—ALL SAINTS' HOSPITAL, Austral-street, West-square, S.E. Afternoon and evening course in urology.—SOUTHEND GENERAL HOSPITAL, Southend. Week-end course in [illegible] (July 13th and 14th).— [illegible] only to members and

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, July 11th.—2 P.M., Dr. R. W. B. Ellis: Chronic Chest Disease. 3 P.M., Dr. D. Nabarro: Clinical Pathology in Pædiatric Practice (Demonstration).
Out-patient clinics: mornings, 10–12 noon. Ward visits: afternoons, 2–3.30 P.M. (except Wednesday).

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
WEDNESDAY, July 10th.—5 P.M. (1, Wimpole-street, W.), Dr. Paul Dudley White: Congestion without Myocardial Failure (St. Cyres Lecture).

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, W.C.
TUESDAY, July 9th, and WEDNESDAY.—Conference for Medical Officers in Industry from the Tropics.

BRITISH ASSOCIATION OF RADIOLOGISTS.
SATURDAY, July 13th, and SUNDAY.—Congress in Birmingham.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, July 10th.—4 P.M. (St. James' Hospital, Ouseley-road, Balham, S.W.), Dr. W. G. Barnard: Pathological Demonstration.

BRITISH SOCIAL HYGIENE COUNCIL.
MONDAY, July 8th, to FRIDAY.—Imperial Congress at London School of Hygiene and Tropical Medicine, Keppel-street, W.C.

UNIVERSITY OF BIRMINGHAM.
TUESDAY, July 29th.—3.30 P.M. (General Hospital), Mr. Cyril Raison: Abdominal Emergencies.

NOTES, COMMENTS, AND ABSTRACTS

LIFE AND LEISURE

THE ninth and final volume of the New Survey of London Life and Labour has now appeared.[1] The survey has occupied seven years, having been set on foot in 1928 on the initiative of the London School of Economics, with the assistance of grants from various bodies. The object was to follow the general scheme and methods of Charles Booth's inquiry, the results of which were published between 1889 and 1903, with such changes as are necessitated by alteration of circumstances and the development of new sources of knowledge. The endeavour has been to present a comprehensive record of social and economic conditions in London to-day, and a comparison with thirty or forty years ago.

The previous volumes have been principally concerned with the material conditions of the London worker's life and livelihood. The present volume deals with the pursuits of his leisure.

It is estimated that the average London worker's daily hours of labour when fully employed are now shorter than those prevailing 40 or 50 years ago by about an hour—rather more than an hour in the case of the unskilled labourer and rather less in that of the skilled artisan, and that the average worker in London has an increased margin of income above that which is absorbed by bare necessities.

The survey begins with a description of London popular amusements and entertainments, sports, hobbies, holidays, and outings—i.e., the full range of leisure pursuits which are primarily concerned with healthy enjoyment and recreation, rather than with self-improvement on the one hand or mere indulgence on the other. A distinction is drawn between cultural and non-cultural pursuits, and also between the active and passive types of amusement. It is found that the changes that have taken place in the amusements and recreation of the people have, generally speaking, affected the passive type of amusements much more profoundly than those of the active type. The progress of mechanisation of passive forms of entertainment, typified by the growth of the cinema and of broadcasting, is traced and an endeavour made to estimate their immediate and remote effects on the pursuits of leisure as a whole.

It is shown that in the main the cinema has created and supplied an entirely new demand, and that this is even more emphatically true of broadcasting. Forty years ago the part of working-class leisure now filled by the cinema was either non-existent or was to a large extent passed idly at the public-house, club, or street corner; and the change has been for the good even though the great educational possibilities of the films have so far been very imperfectly attained.

The second part of the survey deals with social organisations, the primary object of which is the better and more enjoyable use of leisure. The first chapter is concerned with workmen's clubs and there follow chapters dealing with social organisations for boys and girls. The critical importance of the period of adolescence, to the appreciation of which medical men are always trying to educate the public, appears clearly from the study of the various forms of social delinquency and evil habits which are surveyed in the third part of the volume. One of the main lessons of these inquiries into excessive drinking, gambling, sex-delinquency, and crime is that the root cause of these social maladies, in so far as they can be ascribed to environment is the absence or weakness of healthy interests.

The third part of the volume contains the results of careful investigations of some of the principal aspects of these social maladies. The survey of the drink problem is largely based on information obtained by visits to over 600 public-houses. The chapters on drink and gambling emphasise the concurrent decline of the former and the increase of the latter habit since the time of Charles Booth's survey.

One conclusion reached is that since drinking at the public-house is to a large extent an incident of social intercourse, "better accommodation and comfort tend to slow down the rate of drinking and therefore are to the public interest, though not perhaps to that of the brewers, whose object is rapid turnover, and who believe that this is favoured by 'perpendicular drinking'". The chapter on sex-delinquency includes a survey of the sources and predisposing causes, and also of methods of repression and prevention. The survey shows the change of character in sex-delinquency. Reason is given for the belief that at present there are not now more than 3,000 professional prostitutes plying their trade in the London areas, mainly in the regions near the main railway stations or docks where strangers and seafarers abound.

Since the war there has been an increase in the proportion of girls who indulge in "sex adventure" of a non-commercial nature, especially in the middle rather than in the working classes, but on the whole relationships between young people of different sexes are deemed healthier and more natural than they were twenty or thirty years ago. Among environmental conditions favourable to sex-delinquency the broken and undisciplined home is found to be the most important single factor.

For the chapter on crime a special analysis has been made by the courtesy of the commissioner of metropolitan police, of the dossiers of "first offenders" in 1927, so as to trace how far they have again been found guilty of offences during the subsequent five years. The broad result is to show that in the London area more than four-fifths of the male first offenders of 1927 were not again found guilty in the following five years. The age analysis discloses that it is the younger offenders who are most likely to be re-convicted. Of the minority who were again found guilty more than half re-appeared only once, but there was a small core of persistent offenders (about one per cent. of the total number of first offenders) who were re-convicted five times or more.

The fourth part of the volume consists of a set of original descriptions of the life of working-class families as seen from the inside, from the pens of the actual breadwinners or housewives.

The results of the survey will confirm the general impression of the direction of movement during the last half century. It provides ample scope for speculation on the whole question of leisure, its uses and abuses, which will clearly engross the attention of future generations.

The variety of organisations by means of which the Londoner may beguile his hours of freedom from work varies from the University Extension Courses to the gossip of the public-house; and follow him inexorably from the day-nursery into which his mother deposits him while she goes to work, to the men's institutes to which he can repair in his ripe years.

We cannot doubt that on the whole the movement has been to the good. But there is another side to the picture. It is suggested in this work that the decrease in drunkenness is of value to the community, not only for obvious reasons but also because drink is "undeniably an anodyne." Is it not equally true that for the person who must always be searching for amusement, who can never be alone, amusement surely represents merely a soporific and he is as much fleeing from reality as his grandfather did in the bar of a public-house?

Another unsatisfactory feature brought out is the enormous relative growth of "passive" amusements;

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[1] The New Survey of London Life and Labour. Vol. IX. Life and Leisure. [illegible] Smith, G.C.B. London: P. G. [illegible] 445. 17s. 6d.

those which are presented ready prepared and predigested, requiring no intellectual or physical activity; the cinemas which, we are told, are capable of seating 1,000,000 per day, having sprung from nothing in the last 40 years; the greyhound racing courses, all started within the last fifteen years, and which now number 12 within the London area and whose total attendance in 1932 was ever 9,000,000.

The growth of passive amusements is out of all proportion to those which require active participation. Thus the cinemas seating capacity and the gate attendances quoted above may be contrasted with the increase in players of games on the grounds provided by the L.C.C.; (the figures given refer to the number of applicants to play respectively in 1926 and 1933), cricket 1078, against 1005, no increase; football 911, against 1006, less than 100 increase; or with the increase in the borrowers from public libraries in the County of London, which is estimated at 156 per 1,000. The increasing desire to take the easy mechanical path of collecting amusement or information, the latter especially from the B.B.C., in preference to the active cultivation of either hand or brain is certainly disturbing.

Finally, it is clear that there is an immense emphasis to-day upon "the herd." More and more do people do things together in crowds and there seems to be more in this than fortuitous circumstance; it is essentially a flight from the individual, from personal responsibility, and the need to think. It is true that the scout and guide movements and the working men's club and institute union, have seen the danger of this tendency and try to encourage individual activity and responsibility within the group. It is true also that there has been development in such individual hobbies as gardening, bird fancying, photography, and the like, yet the balance is strongly on the other side. The frequency of groups of hikers as compared with the solitary tramper, the masses of cyclists with their club badges, the vision of the pier at Brighton or the beach at Southend, all bear their noisy testimony to this fact. It is immensely desirable that people should have holidays and that they should escape from the dust and noise of London, but a very large percentage of the benefit is lost in the clamour of the crowds. It would seem that our amusements are tending to become as mechanical as our work, and though the craftsman has become irretrievably lost in the whir of the machine, surely it becomes the more important that his leisure hours should not be absorbed mainly or only in the merry-go-round of Hampstead Heath. Socialisation has helped much to improve the lot of the working man; nevertheless the world's best work has come from the solitary, and we need to see that we do not swamp all individual effort by our host of organisations.

INSTRUMENTS OLD AND NEW

SOME interesting additions have been made to the historical section and the collection of surgical instruments in the museum of the Royal College of Surgeons of England during the past twelve months, and among them are a number of Roman bronze instruments, found in London dating from the first century, which have been presented by Dr. Mervyn Gordon, F.R.S.

Some of the specimens, used for medical, toilet, and other purposes, were recovered from the bed of the Walbrook and others were found in the mud of the Thames, where they had lain since the Roman occupation. Six of the bronze toilet instruments, together with a bronze coin bearing the head of Vespasian A.D. 78, were excavated from the bed of the Walbrook in 1933, and twenty-three other instruments which include forceps, probes, spoons, and sounds, were found in the City. A further addition to the series include the blade of a forceps, bronze ear-scoops, sounds, and a large number of bodkins and needles of bronze, wood, and bone, which were found in the mud of the Thames. Among the toilet implements are two bronze nail-files and a combined nail-cutter and ear-scoop, evidently employed for manicuring purposes. From the same donor have also come several cutting knives of the mediæval period and a number of ointment jars, salve pots, and glass phials used by London apothecaries in the seventeenth and eighteenth centuries.

A large collection of surgical instruments used by the late Mr. Charles Heath, F.R.C.S., has been presented to the museum by his executors. His inventive genius is well illustrated in the many instruments he devised in connexion with his work on the nose, ear, and throat. They include examples of his dressing forceps with lifter handles, his tympanic knife, nasal polypus snare, laryngeal scissors, and mastoid gouges, and his mallets of standard silveroid. There are also a number of personal relics.

A gift of historical interest has been received from the trustees of the late Herbert Spencer. It consist of a rosewood box containing forty-eight microscope slides, mounted and prepared by Spencer between 1836 and 1840, which were originally kept at the Athenæum Club. The specimens are chiefly botanical, and consist of sections of leaves and stems of plants and trees such as the elder, dock, acacia, logwood, and turnip. Each slide is carefully labelled in his autograph with the botanical name of the specimen.

An exhibit showing the origin, development, and history of the tourniquet, arranged by Mr. C. J. S. Thompson, hon. curator of the museum, has now been completed and placed in the instrument room. The evolution of the appliance is shown from the primitive garrot used by Morell in 1674. This type was used in amputations in the seventeenth century and was described by Young of Plymouth in 1678 as "a hard linen wad to be placed over the vessel and held in place by a towel passed around the limb, its ends being tied together. The towel was then made tighter by a battoon or bedstaff." Petit's invention of the screw tourniquet in 1718, superseded the use of the cord and stick and limited the pressure to the artery. The advantage of the screw type was soon recognised, and from the eighteenth to the nineteenth century the appliance passed through many modifications. These are illustrated in the many examples of such instruments as Knaur's, Westphalen's axle-type, the English axle, the cylinder type, and the field tourniquet devised by Maclure. Other specimens include the tourniquets invented by Usher Pearson, Viedemann, and Perret, all of which form links in the history of the appliance.

All these additions to the museum will be on view between July 11th and 25th.

PRIMITIVE SOCIETIES

PROMISE of unusual interest for ethnological and anthropological students is made in a book with the inviting title of "Primitive Society and its Vital Statistics."[1] In the preface Dr. Krzywicki explains his concern to show that "there exists a division of primitive life not hitherto sufficiently taken into consideration by science—that of vital statistics" and, he contends, no study of primitive communities should be undertaken without their aid. A comprehensive table of contents summarises topics such as factors determining density of population among primitive communities; population estimates; causes leading to depopulation; effects of contact with higher cultures; natality and mortality experiences among various peoples, and so forth, while a really admirable bibliography calls for special mention.

Following these attractive preliminaries it is disappointing to find that though Dr. Krzywicki has assembled with infinitely laborious research a variety of data, these data are widely removed from modern conceptions of what is meant by the term "vital statistics." The material he examines with prodigious patience comprises an accumulation of facts and figures from the writings of a multitude of travellers and casual observers whose works have been published at various periods during the past two centuries. The author himself says that the numerical data are of very doubtful value, and that in some cases the figures cease to have any value whatsoever; yet he contends that as they are the only data available they must be referred to as the only existing evidence. Since the data so assembled and regarded as "evidence" are, in the main, conjectural estimates, we cannot agree that they constitute anything but unstable bases for scientific reasoning.

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[1] Primitive Society and its Vital Statistics. By Ludwik Krzywicki, Ph.D., Professor of Social History in the University of Warsaw. London: Macmillan and Co., Ltd. 1934. Pp. 589. 20s.

It would be interesting to know what reasons persuaded Dr. Krzywicki to accept without question certain views and estimates, and to reject others. For example, on p. 93, when referring to the Report of the Commission appointed to inquire into the Decrease of the Native Population of Fiji, 1896, he expresses the opinion that "the findings contained in that Report are not perhaps always accurate as a whole," possibly because, in his view, they often "merely quote the explanations furnished by the natives themselves." In point of fact, the Fiji inquiry was an admirable piece of work, conducted on scientific lines, by thoroughly competent men fully conversant with the life and language of the Fijian peoples; such praise can but rarely be given to many of those whose works are liberally quoted in this book. It is difficult to understand how the author hopes to succeed in shedding new light upon important matters concerning primitive peoples, to trace the complex and imperceptible population changes at work among such peoples, or to discuss such problems as the fertility of women among hunting races and settled peoples, if his reasoning has to rest upon the shifting sands of unreliable or conjectural data which cannot, under any pretext, be defined as "vital statistics." Experienced workers among primitive peoples at the present day are convincingly certain that, in the absence of properly conducted inquiries by means of population enumerations *personally* organised and carried out at more or less regular intervals, together with personally collected data relating to births and other immigrants, to deaths and other emigrants, &c., it is impossible to measure the effects of various influences or particular customs on the life of a tribe or people. However pressing the desire, or ambitious the worker in this field of endeavour, the answer must still be that we shall not know the answers to problems peculiar to the lives of this or of that people without the help furnished by dependable statistical records.

TUBERCULOSIS RISKS FOR THE MEDICAL STUDENT

SINCE 1926 Dr. O. Scheel, of the communal hospital, Ullevaal, in Oslo, has kept its students under medical supervision (Nord. med. tidskr., March 30th, 1935, p. 481). His figures up to last summer concern 1176 students, and he classifies them in five groups: (*a*) 361 who were Pirquet-positive before beginning clinical work or during its first two months; (*b*) 207 who were Pirquet-negative before or during their clinical work; (*c*) 246 who were Pirquet-negative before or during their clinical work and were inoculated with B C G; (*d*) 262 who were Pirquet-positive when first examined after their clinical work had lasted at least two months; and (*e*) 100 who had a history of some manifestation of tuberculosis before they began their clinical work. (With only one exception these last were Pirquet-positive.) After the investigations had proceeded for some time, it was found desirable, when a Pirquet reaction was negative, to follow it up with a Mantoux intracutaneous injection of 0·1 or 1 mg. of tuberculin—to make sure. The proportion of positive reactions increased with the years of study more rapidly than among persons of the same age in other walks of life, but not so rapidly as among the Ullevaal nurses, more exposed to infection than the students. Tuberculous manifestations appeared nearly three times as commonly in the originally Pirquet-negative students as they did in the originally Pirquet-positive students. The students inoculated with B C G showed less than half the tuberculosis morbidity of the Pirquet-negative students who dispensed with B C G. The behaviour of the tuberculin reactions after the administration of B C G suggested that it is more potent when given by injection (214 cases) than when taken by the mouth (32 cases).

Scheel's studies throw new light on the question of super-infection of persons already Pirquet-positive. The tuberculosis morbidity among the originally Pirquet-negative students was comparatively high in the first two years of clinical work. There was no similar accumulation of cases among the originally Pirquet-positive students in their first two years. This implies that the importance of a super-infection is small. The figures in this study are too small to justify final conclusions, but they establish a good case for further research in this field.

HYGIENE FOR TEACHERS

A NEW edition of a work on hygiene and sanitation,[1] apparently intended for those training to be school teachers, has reached us. It is, on the whole, accurate in its facts, of which perhaps too many are included for this class of student. It is doubtful whether it is worth while introducing topics like anaphylaxis, allergy, and Ehrlich's side-chain theory when their implications cannot be fully explained. An extensive bibliography, supplied for collateral reading, consists almost entirely of works published in the U.S.A., and is therefore not readily available for the British student.

DEAD AND LIVING ANATOMY

A LITTLE book[2] written for students and practitioners of chiropody will be doubtless of value to them in their efforts to reach a higher level from which they can survey their field. Remembering the author's preface, we take no account of omissions, and but little of errors in detail, which possibly are irrelevant to the special reader's work. The parts are more fully dealt with as one approaches the foot, but it is here that we look in vain for applied anatomy. The values of the arches and the primary value of muscles here might have been stressed; the incidence of the line of weight transference, and the effect on it and on the arches of different positions of the foot, and so on, might have been dealt with, even diagrammatically. The figures are clear and good if we disregard minor errors, and we hope that the author will include some consideration of living anatomy in another edition.

THE RETREAT, YORK

THE annual report of this registered hospital for the treatment of mental disorders, which appeared recently, is the 138th in succession, a fact which speaks for the long repute of the institution. At the beginning of the year 1934, the period covered by the report, there were 182 patients; 95 were admitted during the year, the total number under care being 277; of these patients 71 were discharged and 20 died, 186 being therefore on the books at the beginning of 1935. Of the admissions, 54 per cent. were voluntary patients, and of the 71 discharges 23 were classified as recovered and 37 relieved, the remainder not having improved. All the 20 deaths were from natural causes. Dr. Neil Macleod, the medical superintendent, writes in the report of the significance of out-patient departments in relation to the mental hospital, stating that every town of some size and importance should be equipped with a functional nervous disorder clinic where neurotic conditions can be properly studied and appropriate methods of treatment evolved. Such a clinic, he says, exists in York, and the numbers of those attending it is increasing, but, nevertheless, he feels that a much larger number of patients in the neighbourhood require and desire psychotherapeutic help. He looks to such clinics in all parts of the country to help the general public to realise that "mental illness is not a doom or a blight, but is a form of disfunction which demands enlightened treatment, whether in an out-patient department or in a mental hospital, according to the degree and quality of the malady."

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[1] Hygiene and Sanitation. Third edition. By Jesse F. Williams, M.D., Professor of Physical Education, Teachers' College, Columbia University. London: W. B. Saunders and Co. 1935. Pp. 372. 9s.

[2] The Anatomy of the Leg and Foot. By Philippa N. Vaus, M.R.C.S., L.R.C.P., Lecturer to the London School of Chiropody. London: Baillière, Tindall and Cox. 1935. Pp. 107. 6s.

Vacancies

For further information refer to the advertisement columns

Barrow-in-Furness County Borough.—M.O.H. &c. £900.

Belfast, Royal Maternity Hospital.—Res. M.O. At rate of £52.

Birmingham, General Hospital.—Res. Anæsthetist. £70.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Asst. M.O. £300.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.

Bolton, Royal Infirmary.—H.S. £125.

Bristol Royal Infirmary.—Sen. Cas. H.S. Also Sen. Obstet. H.S. Each at rate of £100. H.P.'s and H.S.'s to Spec. Depts. Each at rate of £80. Also H.S. to Ear, Nose, and Throat Dept. £80.

British Postgraduate Medical School, Shepherd's Bush.—Anæsthetist. Also 1st Asst. in Dept of Medicine. Each £300. Also 2 H.S.'s.

Buckinghamshire County Council.—Asst. County M.O.H. £500.

Buxton, Devonshire Royal Hospital.—H.P. also Asst. H.P. At rate of £200 and £150 respectively.

Cancer Hospital, Fulham-road, S.W.—Surgeon.

Canterbury, Kent and Canterbury Hospital.—2 H.S.'s. Each at rate of £125.

Cape Town Hospital Board.—Medical Asst. to Radiological Dept. £600.

Cardiff, Prince of Wales' Orthopædic Hospital.—Sen. and Jun. H.S. At rate of £200 and £100 respectively.

Cardiff, University College of South Wales and Monmouthshire.—Asst. Lecturer in Dept. of Physiology. £400.

Ceylon, Colombo Municipal Council.—City Microbiologist. Rs. 12,000/- a year.

Chester, Royal Infirmary.—H.P. also H.S. Each £150.

Chichester, Royal We [illegible] and Jun. H.S.'s. At rate of £175.

Children's Hospital, [illegible] Asst. Surgeon.

Chorley, Lancs, Chor [illegible]—H.S. At rate of £150.

Cobham, Surrey, Schiff Home of Recovery.—Res. Surg. O. At rate of £200.

Colchester, Essex County Hospital.—H.P. £150. Also Asst. H.S. £120.

Croydon, Mental Hospital, Upper Warlingham, Surrey.—Asst. M.O. £350.

Derbyshire Hospital for Sick Children.—Res. H.S. At rate of £130.

Devon, Royal Devon & Exeter Hospital.—H.S. At rate of £150.

Devonport, Prince of Wales's Hospital.—H.P and Cas. O. At rate of £100.

Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts., Cas. H.S. Also H.S. Each £175.

Eastbourne, Princess Alice Hospital.—Res. H.S. £150.

Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £120.

Gloucestershire, Royal Infirmary.—2 H.S.'s, also H.P. Each at rate of £150.

Great Yarmouth, General Hospital.—H.S. £140.

Grimsby County Borough.—Asst. M.O.H., &c. £500.

Grimsby and District Hospital.—Sen. and Jun. H.S.'s. £200 and £150 respectively.

Hackney Hospital, High-street, E.—H.P. At rate of £120.

Halifax County Borough.—Asst. Maternity and Child Welfare M.O. £500.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—H.P. also Cas. Surg. O. At rate of £100.

Harrogate Royal Bath Hospital.—Res. M.O. £156.

Herefordshire General Hospital.—Res. Surg. O. £150.

Hospital for Consumption and Dis. of Chest, Brompton, S.W.—Res. M.O. £350.

Hospital for Sick Children, Great Ormond Street, W.C.—Med. Reg. £300.

Hospital for Tropical Diseases, Gordon-street, W.C.—Surgeon.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Hull Royal Infirmary.—H.S. to Ophth. Ear, Nose and Throat Depts. Second H.P. and third H.S. Each at rate of £150. Also H.P. for Sutton Branch Hospital. At rate of £160.

Ilford [illegible] O.H. £500.

Ilfor [illegible] *ital.*—Asst. Surg. to Fracture and [illegible]

Ipsw [illegible]—H.P. £150.

Ipsw [illegible] *Ipswich Hospital.*—H.P. and H.S. [illegible]

Kingston and District Hospital.—Asst. Visiting Obstetrician. £300.

Lancaster Roy [illegible] At rate of £130.

Leicester City [illegible] M.O. £900.

Lincoln, Coun [illegible] t rate of £150.

Liverpool, Hal [illegible] *treet.*—Res. M.O. At rate of £120.

Liverpool, Royal Children's Hospital.—Hon. Asst. Phy.

Liverpool, Stanley Hospital.—H.P. and 3 H.S.'s. Each at rate of £100.

London Homœopathic Hospital, Gt. Ormond Street, W.C.—Hon. Phys. for Dis. of Nervous System.

Macclesfield, General Infirmary.—2nd H.S. At rate of £150.

Manchester, Ancoats Hospital.—H.S. At rate of £100. Also [illegible] te of £100.

[illegible] *'tal and Holt Radium Institute,* [illegible] . O. At rate of £150.

[illegible] *for Infectious Diseases.*—Jun. Res. Asst. M.O. At rate of £250.

Manchester, Victoria Memorial Jewish Hospital, Cheetham.—Clin. Pathologist. £250.

Middlesbrough, North Riding Infirmary.—Cas. O. Also third H.S. At rate of £150 and £125 respectively.

Middlesex, North Middlesex County Hospital.—Surgeon. £500. Asst. M.O. At rate of £350. Also Jun. M.O.'s for Special Hospitals. Each at rate of £250.

Mitcham, Wilson Hospital.—Res. M.O. At rate of £120.

Montrose, Royal Asylum.—Jun. Asst. M.O. £300.

Newcastle General Hospital.—Two H.S.'s and one H.P. Each at rate of £150.

Newcastle-upon-Tyne Hospital for Sick Children.—H.P. and H.S. Each at rate of £100.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. Anæs. At rate of £100.

Nottingham, Children's Hospital.—Res. H.S. At rate of £150.

Nottingham General Hospital.—H.S. for Fracture and Orthopædic Depts. £300.

Nottinghamshire, C. C. Education Committee.—Asst. School M.O. £500.

Oldham, Boundary Park Municipal Hospital.—Res. Asst. M.O. At rate of £200.

Paddington Hospital, Harrow-road, W.—Asst. M.O. £250.

Plymouth, Prince of Wales's Hospital, Greenbank Road.—Asst. H.S. At rate of £120.

Preston and County of Lancaster, Royal Infirmary.—H.S. for Special Depts. At rate of £150.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.S. Also Cas. O. Each at rate of £125.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—Hon. Asst. Phys.

Radium Beam Therapy Research, Radium Institute, 16 Riding House Street, W.—Asst. M.O. At rate of £250

Reading, Royal Berkshire Hospital.—Surg. Reg.

Rhondda U.D.C.—2 Asst. M.O.'s. Each £500.

Royal Air Force Commissions.

Royal Eye Hospital, St. George's Circus, S.E.—Hon. Asst. Surgeon.

Royal National Orthopædic Hospital, Great Portland-street, W.—H.S. for Country Branch. At rate of £150.

Royal Naval Medical Service.—Nine M.O.'s.

Royal Northern Hospital, Holloway, N.—H.P. At rate of £70.

Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £180.

St. Andrew's Hospital, Devons-road, Bow, E.—H.P. At rate of £120.

St. Bartholomew's Hospital Medical College.—Helen Cave Memorial Scholarship. £200.

St. Helens C.B.—Two Asst. M.O.H's. £500 and £600 respectively.

St. Luke's Hospital, Sydney-street, Chelsea, S.W.—H.P. At rate of £120.

St. Thomas's Hospital.—M.O. in charge of Physio-Therapeutic Dept.

Salford Royal Hospital.—Orthopædic Registrar. £100.

Scotland, General Board of Control.—Deputy Commissioners. Each £953.

Sheffield, Children's Hospital.—H.S. At rate of £100.

Sheffield, Royal Infirmary.—Ophth. H.S. At rate of £120. Also H.S. and H.P. Each at rate of £80.

Southend-on-Sea, General Hospital.—Obstet. Officer. £125.

Stafford, Standon Hall Orthopædic Hospital.—H.S. £200.

Sudan Medical Service.—M.O. £E720.

Sunderland, Royal [illegible]

Swansea, General [illegible] At rate of £150.

Victoria Hospital [illegible] *Chelsea, S.W.*—H.P. and H.S. Each at rate of £100.

Warrington County Mental Hospital, Winwick.—Asst. M.O. £500.

West End Hospital for Nervous Diseases, Gloucester Gate, N.W.—Res. H.P. At rate of £125.

West End Hospital for Nervous Diseases, 73 Welbeck Street, W.—Hon. Med. Psychologists for Child Guidance Unit. Also 2 Hon. Clin. Psychologists.

Westminster Hospital, Broad Sanctuary, S.W.—Wander Scholarship. £250.

Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S. At rate of £150.

Willesden General Hospital, Harlesden-road, N.W.—Hon. Surgeon.

Wolverhampton, Royal Hospital.—H.S. for Fracture and Orthopædic Dept. At rate of £100.

Woodside Hospital, Muswell Hill, N.—Res. H.P. At rate of £100.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—Res. M.O. £175.

Worcester, Royal Infirmary.—Jun. H.S. £120.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Newport, Isle of Wight.

PRINCESS BEATRICE HOSPITAL, LONDON.—Lord Lord Carisbrooke is appealing for £100,000 for this hospital at Earls Court, which was called after his mother when it was rebuilt in 1930. It is now £68,000 in debt and costs £24,000 a year to maintain, about £9,000 of this being contributed by patients. The hospital's financial troubles have been caused by the coming of the economic crisis at a time when building was in progress, this making it impossible to complete the original schemes.

ADDRESSES AND ORIGINAL ARTICLES

A CLINICAL STUDY OF HEADACHES *

By Sir Edmund Spriggs, K.C.V.O., M.D., F.R.C.P. Lond.
SENIOR PHYSICIAN, RUTHIN CASTLE

(Concluded from p. 8)

Migraine

That migraine is different from other headaches has probably always been recognised, though the word has been used at times to include habitual headaches generally. With a reservation about the word "diurnal" which calls to the mind the prevalence in those days of malaria, Galen's works provide a description as modern as any.

> "Cephalæa is a diurnal headache with vehement occasions from small causes. The sufferer cannot endure noise, raising of the voice, the brilliance of light, or movement; but seeks quiet and a dark chamber on account of the severity of the pain. Some are as under the blows of a hammer, some as if crushed and distended; and in not a few there is pain to the roots of the eyes. There are, as in epilepsy, remissions when there is complete freedom."

One of the sufferers in this series, a man, used words which were almost the same—"as if hit with a hammer."

Migraine is the most frequent of headaches. In this series it forms the largest group, numbering 103 cases; to these may be added 14 migrainous subjects placed in other groups because the migraine factor seemed of lesser importance. Thus there were 117 migrainous persons among 500 patients with considerable headaches, or 23 per cent. Taking the whole period under review, and remembering the minor headaches which were omitted from this series, migraine was not present in more than 2·5–3 per cent. of the 4796 patients. This figure is lower than that given by some authors.

The characteristic features of migraine may be put under nine headings:—

1. It is periodic, using the word to mean not simply intermittent, but in the stricter astronomical sense of the (more or less) regular return of the same or similar phenomena.
2. It often begins in childhood or youth.
3. It is often hereditary. Then, in order, are:—
4. Premonitory symptoms, sometimes half a day or a day before.
5. The aura.
6. One or both-sided headache, which may be intense.
7. Nausea, vomiting, polyuria.
8. Exhaustion after severe attacks.
9. Complete recovery.

There is no part of the typical sequence which may not be absent. The aura, the headache, the misery, the nausea, the vomiting may each occur in the migrainous subject with none, some, or all of the others. And should the sufferer be subject to other aches or pains the migraine will seem to take them into its periodic course.

Fig. 3 shows the age at onset for the whole group and for the two sexes. In this series the latest age of onset was 62, in a woman. The oldest person admitted with migraine was a man of 66. He had had it on and off all his life. and was the subject of cervical arthritis. Four others were over 60. The well-known tendency of migraine to cease with advancing years can be illustrated by a gradation of these patients. The attacks may cease at any age without any special treatment, but are apt to recur with strain or ill-health, as many of the histories show. Treatment for the exciting cause or factor may again lead to relief.

EXCITING CAUSES

Any disturbance or strain may precipitate a migraine in a person who is at that time liable to it. The exciting causes are, therefore, as numerous and variable as are the circumstances of our daily lives. Fifty different causes, or in different wordings, were mentioned by these 103 persons.

Nervous causes, when put together, formed much the most frequent, 39 cases. They may be grouped as follows: upset, agitation, or anxiety, 15; excitement (including dinner or bridge party, talking, visitors), 14; working mentally too much or too long, 10.

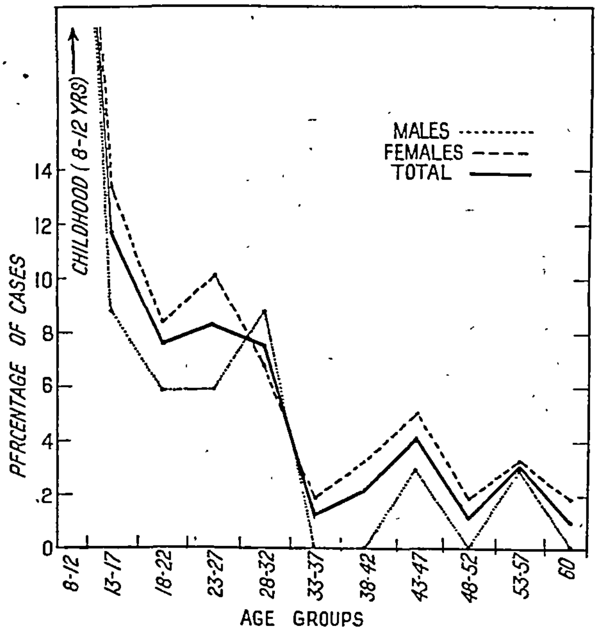

FIG. 3.—Age at onset of migraine. The incidence in the age-group 8–12 (not shown in chart) is 53·2 per cent. made up of males 67·6, females 45·0.

Simple fatigue or getting tired—i.e., not specially mental fatigue—was mentioned by 17. In one even a walk would bring on a headache.

The next large group is that of food, some of the instances being typically allergic or atopic. There were 18 out of the 103 who recognised that the wrong food would bring on a headache.

The main causes they gave were rich food, creamy things, alcohol, port; and the following foods were each mentioned once: pork, ham, beef, eggs, nuts, roughage. Tobacco was given as a cause once. The skin tests, and a careful trial, are valuable in the diagnosis of allergic and atopic exciting causes. It appears, however, from these numbers that care should be taken in unduly restricting diet by guesswork. Some of these patients had for a long time gone without certain foods in vain because some other person had been helped by that deprivation.

Other causes reported were: constipation, 9; indigestion or abdominal pain (various conditions), 7; motoring, 5; "journeys," 4; riding, 2; menstruation (before or after), 5. East winds and cold weather were mentioned by 4, exertion in hot weather by 1. In 5 headaches were brought on by reading at night, any glare or strong light, or the cinema.

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* The Croonian lectures for 1935, delivered before the Royal College of Physicians of London on May 14th, 16th, and 21st. The lectures were illustrated by numerous case-histories and lantern slides.

Sleep is as a rule the best cure of all for a migraine. It appears, however, sometimes as an adverse influence, for two or three were liable to headache if they slept too long in the morning. One young man had a regular morning headache, which was avoided when he was waked at 7 o'clock and took a walk before breakfast. Those who get a headache on a Sunday, of whom there were two in this series, one a doctor, probably belong to this group. One mentioned that a heavy sleep at night would bring on a headache and two an afternoon sleep.

The following exciting causes were mentioned by one person each—a particular place, a stuffy room, boredom, a dog barking.

In childhood the bilious attack or headache is liable to come on with the excitement of anticipation such as before an examination or a party. With advancing age anticipation is better borne and the headache will come on after the party. And with the further progress of years the nervous system can bear both the thought and the event without disturbance.

AURÆ

The best known prodromal sign, and the commonest in this series, is a feeling of unusual fitness. George Eliot wrote "I am dangerously well to-day." Other prodromal symptoms were tiredness, restlessness, poor sleep, depression, a distaste for food, indigestion, or "an undesirable sensation that I am in for it."

Just half the patients reported an aura, and the proportion was the same in each group. The auræ were mostly visual, one only was coloured, "a rainbow." Non-visual auræ were, in order of frequency, hot or sore eyes, dizziness, pressure or tension on one side, aphasia, soreness of scalp, pins and needles in arms and legs, stiffness, numbness, abdominal discomfort.

It has been suggested that the absence of an aura in many migrainous patients is due to the fact that migraine often comes on in the early morning and that the aura is over in sleep, or wakes the person and is forgotten. Whilst such a view cannot be disproved, the figures in this series lend it no particular support. In the first place 18 patients whose headaches came on in the daytime described no aura. They include some who have been subject to characteristic and severe migraine for many years, are good observers, and have had headaches coming on at all times of day without auræ. Secondly, of 33 patients whose headaches came on "on waking" or "in the early morning" 15 had auræ, 18 had not.

The symptoms of the mid-headache were then related in the order of frequency in the whole series, with details of illustrative cases. Most of the attacks were severe. In five there were mental symptoms at the height of the headache and two became maniacal for the time being, until controlled by morphia.

SITE

The site of the headache was often unilateral to begin with, passing in some cases over to the other side or becoming diffuse. In some it might start on either side, and the patient knew whether the attack would be severe or not according to which side was first painful. The ache was in most cases in the fore part of the head, the various main sites being mentioned in the following order: frontal, 25; eyes, 24; temporal, 24; diffuse, 13; vertical, 10; occipital or neck, 14; parietal, 3.

Of the 14 cases with migraine whose pain was in the occipital region 3 had a local cause in a complicating cervical arthritis and fibrositis. It is notable also that of the remaining patients whose migrainous headache was felt in the occiput or neck all had some gastric or duodenal affection—ulcer, gastritis, or delay, or of the colon—spasm with diverticulosis, disorder after partial colectomy, colitis.

AGE

It is common in medical writing, and migraine has received as much study and attention as any disease, to write of migraine as classical or idiopathic if arising in early life, and to apply some other term such as acquired or symptomatic migraine to that arising later. My experience suggests that, apart from the one feature of age at onset, the more thoroughly the case is inquired into the less clear the distinction becomes. It is recognised by all that true idiopathic migraine, excited by a variety of adverse influences, is more likely to be so excited at times of special strain. The onset of migraine in adolescence, for example, is ascribed to the strain of puberty, and afterwards that of entering on the serious business of life. But a greater strain may come later in the conduct of that business or from ill-health and may give rise to migraine then. Further, in some of the cases dating back to childhood a definite physical lesion was present, the treatment of which relieved and cured the headache. And, if too much stress be laid upon the distinction between idiopathic and symptomatic migraine, there is a danger lest the idiopathic cases may be regarded as definitely diagnosed and that further steps be not taken.

The following are examples of migraine arising in early life, recurring with new physical strains, and improving again with suitable treatment.

In a young woman of 27 migraine began with puberty at 14, at first about weekly, then at the periods. She had a nervous but sensible temperament. The headaches became worse with, in turn, appendicitis, duodenal ulcer, a love reverse, and extraction of teeth, improving as each was dealt with or endured. She is now happily married and headaches are few and less severe; but she finds it necessary to keep to a régime of regular rests and a plain anti-constipation diet.

A professional man suffered from migraine with aura till he was 50. He was then "fairly free" until, after a chill, he developed fibrositis at the age of 60. Typical migraine then returned. With treatment he improved greatly and now reports a year later that both headache and rheumatism are well.

The following is an example of migraine arising in later years.

An able man of 53, with no family history of headache, developed migraine on active service at the age of 41. He was a barrister, and his complaint on admission was that after feeling particularly fit and "following the exaltation that one gets in court" he would see flashes with partial blindness, succeeded in 20 minutes by a frontal headache on both sides. With the ache came photophobia, vertigo, discomfort in the abdomen, and constipation. He would persist with his work in court, but, if circumstances allowed, and especially the vomiting, which continued for hours, could sleep. Aspirin gave some relief. After the headache he was "done up." He was subject to constipation and some teeth were infected at the roots.

With treatment the headaches ceased for the time and he was better for some months, ascribed by him to "the nerve-steadying influence of the place." But attacks recurred in court. He therefore took a legal appointment involving important and responsible work, but out of court, and writes that though at times he gets "a migrainous condition, when I feel that the fumes of my distemper are about me " yet the former severe attacks are avoided by this adjustment of life.

It has been stated that acquired migraine is more resistant to treatment. As regards the results of treatment while under immediate care these figures support that statement. But when later results are looked at there is a better proportion of good results in the group of migraine arising after 40.

In the two groups of 30 cases of migraine arising after 20 years of age and 11 after 40, the headaches were in all respects typical of migraine, except that they dated back in many a few years only. They were associated with a definite morbid state, physical or nervous, and were lessened or abolished by removal of the associated lesion or strain. It appears that at all ages up to the fifties, or even over, typical migraine may develop, following very various strains.

My opinion is that there is no real difference in severe cases such as are described here, between "true" and "acquired" migraine, and I venture to suggest that for clinical purposes the distinction should be abandoned.

PERSISTENT AND INTENSE HEADACHES

Most headaches are intermittent. Persistent, that is continuous, headaches were complained of in 45 only of the 500, that is, in 9 per cent. They were found, in order of frequency, in the following groups: organic intracranial, vascular, nephritic, psychasthenic, and mental.

Intense headaches, in which the headache is the only complaint or filled the field to the exclusion of other symptoms, occurred in 85 cases, 17 per cent. of the whole. They were distributed as follows: migraine 36, hyperpiesis 8, nephritis 6, sinusitis 6, eyes 5, rheumatic, nervous exhaustion 4 each, constipation 3, and smaller numbers in other groups.

Mechanism of Headache

To the mechanism of headache I shall refer only in so far as certain features of the cases under review seemed to bear upon that much discussed problem. Recent observations, both experimental and upon the human brain in long operations, during which the patient is under little or no anæsthetic for a good part of the time, show that the most sensitive areas are close to the vessels in the pia mater. This conforms to D. Waterston's work on the extreme sensitiveness of the outer coverings of arteries and their neighbourhood. The dura mater is less sensitive, and the radiations and grey matter not sensitive to ordinary stimuli. For a long time a vasomotor control of cerebral arteries was not demonstrated, but the work of Huber and the more recent confirmation of Penfield showed that nerves and nerve-endings are present along the vessels; also the experimental results of Forbes, Wolff, and Cobb that the pial vessels contract and dilate with stimulation of the sympathetic and vagus respectively.

The vascular theory of headaches, and especially of migraine, foreshadowed for at least two centuries, and well stated by E. Bramwell, was that a preliminary spasm of arteries, associated with the aura, was followed by dilatation at the stage of the pain, which is compared to that of hotache. The peripheral nerves involved are the intracranial branches of the fifth; and it is stated that no headache occurs on that side if the Gasserian ganglion is removed.

That a headache can be produced by vascular changes is probably accepted by all, and is supported by the interesting observations of G. W. Pickering and W. Hess upon the brief headaches following intravenous injection of histamine. The lecturer and his colleagues used subcutaneous injections of histamine frequently in giving fractional test-meals, and S. W. Patterson and J. H. Anderson had made notes of 50 consecutive cases of such injections; 44 of the 50 were not subject to headaches. In 12 of them headaches occurred after histamine, five of which were severe and of longer duration than those described by Pickering and Hess. In 6 of the 50 who were subject to headaches, 4 had a headache after histamine. In 2 the headache produced had the same features as the headache to which the patient was liable. This might mean that the mechanism of the histamine headaches was the same as that of the patients' own headaches, or simply that the injection of histamine acted as an exciting cause.

The vascular theory as at present stated does not seem to account fully for the duration of headaches, e.g., in some of these cases for 12, 24, or 48 hours. The explanation suggested, on that theory, is that as a result of ischæmia from spasm, followed by dilatation, œdema occurs around the vessels, with an increase of intracranial pressure which keeps up the pain and the vomiting. We do see painful spasm of arteries in other parts of the body and it is controlled by nerves, as shown by the benefit, in suitable cases, of sympathectomy. But those arteries are generally diseased. Do we see ischæmia with resulting œdema? Yes; but it cannot be repeated often without damage to the area concerned. It may be said that perhaps the capillary bed in the brain is so extensive that a better recovery can take place than in a peripheral area in a limb. But if so an ischæmic œdema would also occur less easily. Now the headache of migraine can, unlike the attacks of epilepsy, recur again and again throughout a long life without any evidence of cerebral damage. The subjects of migraine seldom become insane, and the headaches of the psychotic groups in this series were not migrainous. It is true that cerebral thrombosis has been reported as a sequel of severe migraine, and there were at least three in this series who developed that condition. But cerebral thrombosis is not uncommon in elderly people, and the clinical features of the patients concerned did not satisfy the lecturer that the thrombosis was a result of the headache.

The long duration of certain headaches might be more easily explained by a consideration of the work of Dale and of Lewis upon the production of histamine and its effects, together with the theory of allergy. It is conceivable that in a sensitised area, owing to the combination of an antigen and cellular antibodies, with effusion through the capillary wall, the damaged endothelial cells might go on giving out histamine, with resulting further reaction, for a long time. The allergic reactions we are able to see—for example, urticaria—can pass away leaving no damage.

Although, as above mentioned, the grey matter is not sensitive to ordinary stimuli, yet the conception cannot be put aside that the tissue which perceives pain may do so independently of its sensitive coverings. If so a true functional headache may have its seat in the sensorium. But it must be admitted that errors of perception of other sensations than that of pain are, apart from insanity, uncommon.

MIGRAINE AND THE PITUITARY FOSSA

It has been observed (Timme) that in certain cases of migraine, especially those occurring severely with menstruation, the pituitary fossa is less roomy than normal; and it is suggested that the headache is a result of the swelling of the pituitary body in a contracted space, which occurs at those times in association with ovarian activity. A. P. Thomson has published an interesting paper on these cases, describing several in which improvement followed the use of a suitable ovarian extract.

My colleague, O. A. Marxer, points out that a lateral view, taken alone, may be deceptive, and to establish that the pituitary fossa is really constricted antero-posterior as well as lateral radiograms must be taken.

Mr. Marxer has examined the pituitary fossa in 656 out of 3000 consecutive cases: 539 persons were not subject to headache; among these were 16 shallow or bridged fossæ (in 4 men and 12 women) = 3 per cent.: 117 persons were subject to headaches; among those were 4 shallow or bridged fossæ (all in women) = 3·4 per cent. In 35 of the 117 persons the headaches were migrainous: 2 of the shallow or bridged fossæ were in this group = 6 per cent. Both were in women; in neither was the headache especially menstrual.

In this series, therefore, the proportion of cases with a constricted pituitary fossa, though definite, was small, and was not much greater in the persons with headache than in those without them.

Treatment

The first aim of treatment is to abolish or influence what the lecturer had called the second order of causes—namely, any condition or disease, physical or mental, which tends to depress the health. The treatment, therefore, medical and surgical, varies with each group of patients according to the diagnosis made, indeed with each patient. Many examples were given in reviewing the various groups.

No habitual headache, whether life-long or arising in adult life, should be accepted as a necessity to be simply palliated and endured, until every possible source, not only of physical but also of mental and psychical disorder, has been excluded so far as possible by an investigation and by appropriate treatment.

In habitual headaches, and especially in migraine, where no removable cause can be found, the establishment of a regular régime of rests, exercise, food, and, when possible, peace of mind, is of first importance. The Galenical writings say the sufferer "must have sleep, happiness, and quiet, and avoid noise, strife, and wine bibbing." In those past the full energy of midlife, a valuable lesson to learn is that an hour's rest, alone, on a couch, or, better, a bed, with sleep if possible, sometime in the middle of the day, will increase the power to work and lessen strains. The itch to be doing something all the time is a fosterer of headaches. Many patients in reply to inquiry write as did an intellectual overactive man, who used the words: "the greatest help has been in learning how to live."

In women the menopause comes to the aid of many, but not always if other strains go on. An artificial menopause has been successful in some, a disappointment in others.

Measures found of special value between attacks in this series include, besides the regulation of rests, work and exercise: reduction of tobacco, of coffee, and the avoiding of skin-sensitive foods and sometimes of other foods. Of drugs gardenal or luminal is valuable. Many find gr. $\frac{1}{2}$ twice a day, especially at times of stress, a useful preventive. Calx sulphurata, an ancient remedy, has been very helpful in some. One grain, twice a day to begin with, is reduced when the subject becomes odorous of sulphides. The drug should be continued for several months; later gr. 1 once or twice a week may be enough. In others of this series calcium lactate, grs. 5–10 t.d.s. seemed to be followed by benefit. Strychnine, arsenic, sodium glycocholate, pituitary, thyroid, ovarian preparations, eucortone, insulin, peptones, calcic protein injections, a combination of iron, copper, and vitamin D, desensitisations—all are recorded as having been followed by good in suitable cases.

TREATMENT OF THE ATTACK

In almost all several methods of treatment have been used. In migraine alone 35 different combinations of physical and medicinal measures are noted as having been successful in different people in arresting or relieving the attack. The following summary was prepared by marking down each time that any given measure was noted, at the end of the period of treatment, as having been useful.

Physical means (in order of frequency of mention, as above).—Rest, sleep, dark, quiet, warmth, induction of vomiting, an enema, gastric lavage, liver pack, pressure on eye, temple, scalp. Capsicum, mustard leaf, thermogene to head and nape, poultices to abdomen, sneezing,

Food or drink (in order).—None, glucose and fluid, tea, glucose, fluid and orange juice, copious hot water, a meal (in a mild case).

Drugs (in order).—Bromides, gardenal, luminal (must be early). *Cachet* of aspirin, phenacetin āā grs. 2, pyramidon and caffeine āā gr. 1. Phenacetin. Acetanilide. A cachet of sulphate of quinine, pyramidon, phenacetin, and magnesia. Belladonna. Novalgin, allonal, dial, and similar drugs. Calomel, sulphate of magnesia, aperients.

Heroin and morphia are unsuitable drugs for habitual headaches. There are, however, a few, a very few, cases in which the physician should use them. As Freud wrote: "No remedy is proof against misuse; if a knife will not cut neither will it serve a surgeon." Ephedrine is a useful remedy in many. Adrenaline is recommended by T. C. Hunt, given very gradually under the skin—e.g., ♏ 1 a minute up to ♏ 10–15. We can confirm his report that headache may be arrested thereby. But some are upset by the cardiovascular effects and prefer other methods.

Among the combinations of measures recorded as having been successful are: In mild attacks the well-known procedure of complete rest at once, with a drug of the phenacetin group or aspirin before vomiting threatens. Or one of the above-mentioned cachets, sometimes a double one, and much tea. Three examples may be given of the combinations which led to arrest of severe headaches.

1. Rest, dark, an immediate enema, calomel gr. 1/10 hourly, 2 drachms of 50 per cent. sulphate of magnesia, and a pint of hot water an hour later.

2. Rest, sipping of hot water, a cachet, and an enema of glucose saline.

3. Rest, dark, no food or drink, phenacetin, and a mustard leaf to the nape.

In a case of the type of clavus hystericus, in which the patient became maniacal, gr. $\frac{1}{3}$ of morphia was given two hourly until asleep; and in the meantime an enema of glucose saline, barley sugar, and insulin.

Dehydration of the brain, by magnesium sulphate in the bowel, or more thoroughly, by putting concentrated saline into the blood, is perhaps worth a trial in severe cases.

[No direct surgical measure for the relief of headache was used in this series. The lecturer spoke of the experience of others from opening the dura mater and cutting nerves, of tying the meningeal artery, and of sympathectomy. He suggested that, on the experimental evidence, a simple trephine hole might be tried in some cases of intense and frequent headache.]

Results

In habitual headaches, and especially migraine, any large reduction in the number and severity of the attacks is a good result.

The following figures are compiled from the records of my colleagues contained in the reports to the family doctor at the end of the stay of each patient.

Immediate result of treatment of 327 patients from three weeks to two months or more.

		Per cent.
No (or slight) headache	216	= 66·1
Much improvement	93	= 28·4
No improvement	11	= 3·4
Worse	7	= 2·1

The test, in the case of those in whom no one causative factor can be eliminated, comes when the patient resumes ordinary life. The returns from the inquiry as to present state, for which thanks are due to a large number of professional brethren, are still arriving. Up to the present the figures are:—

Present state known in 268; 213 are alive; 55 are dead.

In 179 of the 213 alive definite reports upon the symptom of headache have been furnished.

		Per cent.
Report no (or slight) headache	72	= 40·2
Much improved	67	= 37·4
The same	30	= 16·8
Worse	10	= 5·6

In reviewing ancient and modern methods of treatment, some valuable weapons have of late been added to our armoury. None is suitable for all cases and there are no miracles. The way to treat headaches is to find out what is wrong and try to put it right. My feeling after this inquiry calls to mind the old story, which used to be in the German grammar book, of an aged man who called his sons to his bedside and said: "There is treasure in the vineyard. Dig." And they came closer, asking: "Where shall we dig?" But, his breath failing, their father whispered "Dig," and passed away. They dug here, and there, then the parts between, and at length the whole vineyard. And they found no gold. But the next year the yield of grapes was threefold.

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WATFORD PEACE MEMORIAL HOSPITAL.—The accommodation and equipment of this institution are being taxed to the utmost, and it is hoped to erect a three-storey building which will provide room for 52 ordinary patients and 19 private patients. No estimate of the cost of the new buildings has yet been given, but it is said that considerably more than the £35,000 which is in hand will be required. A nurses' home is also urgently wanted. The average cost of in-patients for last year was £2 18s., and the contributory scheme collected £9608.

FURTHER EXPERIENCES OF SERUM IN THE TREATMENT OF PNEUMONIA

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IN September, 1933, a detailed report[1] was published on the use of concentrated antipneumococcus serum in a small series of cases of Type I. lobar pneumonia at Selly Oak Hospital. During the period Oct. 1st, 1933, to April 30th, 1935, the sputum of almost every case admitted to the hospital with the diagnosis of pneumonia has been examined for the purpose of typing the pneumococcus, and 101 cases of Type I. pneumonia, together with 20 cases of Type II. pneumonia, have been treated with intravenous serum. In all, 367 adult patients were "typed," but 53 of these proved subsequently not to have pneumonia, and it is significant that in all but one of the 53 the pneumococcus in the sputum belonged to Group IV. (i.e., did not agglutinate with serum Types I., II., or III.). The ultimate diagnoses in these cases included pulmonary tuberculosis, pulmonary embolus, asthma, bronchitis, infective endocarditis, coronary thrombosis, pyæmia, and pyelitis.

Seven cases of typical primary pneumonia which showed no pneumococci in the sputum, in spite of repeated examination, are excluded from the analysis, and 11 cases in which meningitis was diagnosed within twenty-four hours of admission to hospital are separately described. The latter have been included, however, in the analysis of types, since pneumonia was present in all of them.

GENERAL OBSERVATIONS

The type-incidence and gross mortality of the remaining 307 cases, 79 (26 per cent.) of which were females, are shown in Table I. A clinical or post-mortem diagnosis of broncho-pneumonia as distinct from lobar pneumonia was made in 24 cases, analysed in Table II., where it will be seen that 20 belonged

TABLE I.—*Type and Sex*

Incidence and mortality in 307 consecutive cases of pneumonia

Type	I.		II.		III.		Group IV.	
Total cases and percentage	131 (43)		58 (19)		23 (7)		95 (31)	
Percentage	M. 103 —	F. 28 21	M. 45 —	F. 13 22	M. 15 —	F. 8 35	M. 65 —	F. 30 32
Gross mortality and percentage* ..	38 (29)		18 (31)		7 (30)		18 (19)	

* Including cases of meningitis.

TABLE II

Classification of cases diagnosed as broncho-pneumonia

Type	I.		II.		III.		Group IV.	
	M.	F.	M.	F.	M.	F.	M.	F.
Recovered	—	1	—	—	1	1	8	5
Died	—	—	—	—	1	—	5	4
Total	1		0		3		20	

M = male; F = female.

to Group IV., of which 7 were fatal, giving a 35 per cent. mortality, contrasting with a 19 per cent. mortality for all Group IV. cases, and a 13 per cent. mortality for Group IV. cases of lobar pneumonia.*

TABLE III.—*Type, Sex, Empyema, Meningitis*

The incidence of recoveries and deaths for all types, and recoveries and deaths in treated and untreated cases of Type I. and Type II. cases

Type ..	I.				II.				III.		Group IV.	
—	Died		Rec.		Died		Rec.		Died	Rec.	Died	Rec.
	S.	ns.	S.	ns.	S.	ns.	S.	ns.				
Male ..	22	10	59	12	6	9	11	19	5	10	12	53
Female ..	5	1	15	7	0	3	3	7	2	6	6	24
Total ..	27	11	74	19	6	12	14	26	7	16	18	77
					Meningitis							
Male ..	6	2	0	0	0	1	0	0	0	0	1	0
Female ..	1	0	0	0	0	0	0	0	0	0	0	0
					Empyema							
Streptococcus ..	1				2				0		5	
Pneumococcus ..	11				5				0		2	

Rec. = recovered; S. = serum given; ns. = no serum given.

Table III. sets out the sex-incidence and mortality of all the 307 cases analysed; a more detailed study of Type I. and Type II. cases will be found below.

From a city of over a million inhabitants, Selly Oak Hospital receives roughly a third of all cases of pneumonia sent to hospital, drawn from all parts of the city; conclusions drawn from the study of cases in the hospital are therefore some guide to conditions throughout the city area. The seasonal fluctuation is approximately the same for all types, March and April showing the highest incidence, August and September the lowest, but epidemics of one type or another, lasting over two or three weeks, are often observed.

Children.—It has frequently been stated, on the basis of examination of throat swabs during acute pulmonary infection, that Types, I., II., and III. are relatively uncommon in childhood. Since the pneumococcus can be cultured from the throats of most healthy persons, such a conclusion was speculative, and the results of typing the pneumococci found in pleural fluids, cerebro-spinal fluid, and sputum, give quite a different picture. Fairbrother[2] has recently shown an incidence of 87 per cent. Type I. pneumococcus in empyema occurring in school-children, in a series of 59, and a series of 25 children under the age of fourteen at Selly Oak Hospital during the period under review has given a type-incidence which corresponds very closely with that found in adults, i.e.:—

	I.	II.	III.	IV.
Cases	11	5	2	7
Per cent. ..	44	20	8	28

Meningitis.—Recovery from pneumococcal meningitis without serum has been reported[3] after cisternal drainage, and there have been a few reported recoveries of Type I. cases after the use of concentrated serum intrathecally. None of the cases treated at Selly Oak Hospital during this period has recovered, but results in at least one case (to be reported separately) have been sufficiently striking to make it an obvious duty always to attempt treatment when the type proves to be I. or II. Of 11 cases of pneumococcal meningitis diagnosed within twenty-four hours of arrival, one Group IV. case followed trauma, one Type II. case was otitic, and the remaining 9 were due to Type I. pneumococcus. In 7 of the latter serum treatment was attempted, the routes used being intravenous, intrathecal, and intracisternal; the largest dose given to any one patient was 420,000 units, over a period of one week.

Empyema (diagnosed in life or post mortem) developed in 26 cases out of 307, an incidence of 7 per cent. Table III. shows the type-incidence and organism cultured from the pus: where this was the pneumococcus it was always of the same type as that occurring in the sputum. It is noteworthy that streptococci were found in the pus in 5 out of 7 cases of Group IV. pneumonia, as compared with only one among 12 Type I. cases, and 2 among 7 Type II. cases.

Taking this information together with the figures for those cases of Group IV. infection which proved to be either broncho-pneumonia or not pneumonia at all, it seems legitimate to deduce either (*a*) that if it were practicable to differentiate all Group IV. pneumococci into their true types, fatal cases associated with Group IV. pneumococci would correspond with one of the rarer virulent types, or (*b*) that all Group IV. pneumococci are relatively avirulent, and that some other organism, possibly the streptococcus, is causative in the fatal cases in which Group IV. pneumococci are found. I am not, however, in agreement with some writers who contend that it is possible to make a clinical diagnosis of type, since many characteristic cases of lobar pneumonia occurred in the Group IV. series.

Typing.—The direct method of typing is of great value in expediting treatment: if sputum is immediately available, a result can be obtained and treatment begun in less than an hour. Discrepancies between results of direct typing and of typing by mouse passage occur, but are rare, and the correction necessary is almost always to convert a directly typed Group IV. (i.e., no capsule swelling observed) into one of Types I., II., or III. The wet direct method,[4] using methyl-violet as a stain, is always used at Selly Oak, and rabbit serum appears to give rather more rapid and obvious capsule swelling than horse serum. Direct results are very easily obtained from cerebro-spinal fluid and pus.

Type III. Pneumonia.—While a rather higher proportion than for other types occurred in old age, Type III. pneumonia was found at all ages, and the gross mortality was slightly less than for Type II. cases. A relatively small elevation of temperature was characteristic, and some cases, particularly in old age, were apyrexial; but no other clinical peculiarity was observed in Type III. cases, and apyrexial cases were seen in infections by Types I. and II. and by Group IV. No cases of empyema or meningitis occurred among the 23 patients with Type III. pneumonia.

SERUM TREATMENT

Type I. serum.†—Excluding the 7 cases of meningitis, 94 cases of Type I. pneumonia were treated with intravenous concentrated serum. There were 20 deaths in this group, giving a 21 per cent. mortality for treated cases. During the same period there were

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* If cases of broncho-pneumonia are excluded, the total number analysed becomes 283, with a type incidence:—

I.	II.	III.	IV.
130 (46%)	58 (20%)	20 (7%)	75 (26%)

† The serum employed was prepared by the Lister Institute of Preventive Medicine, and supplied by Messrs. Allen and Hanburys Ltd. It contained 10,000 international units in about 3·5 c.cm.

admitted to the hospital a further 30 patients with Type I. pneumonia who were not treated with serum.

The reasons why these patients did not receive serum were various: (*a*) crisis shortly after admission, and a clinical judgment that serum was superfluous (not always, unfortunately, justified by the event); (*b*) the patients being under twenty and the prognosis therefore being good: I am now personally of the opinion that it is not justifiable to withhold serum on account of age; (*c*) delay in typing, or absence of sputum; (*d*) the temporary charge of wards by acting physicians who were not in agreement as to the value of the treatment.

Two of these patients had meningitis on arrival, and if these are excluded, there were 9 deaths, with a mortality of 32 per cent.

Of 28 patients given serum before the end of the third day from the onset of symptoms, 3 died (12 per cent. mortality); in one of the fatal cases a severe untreated hypochromic anæmia had been present for some months, and in another the pneumonia was a complication in chronic nephritis. Of 20 cases treated on the fourth day, 5 died (25 per cent. mortality), including one delayed death due to erysipelas originating in an empyema wound, and one death from pneumonia in a patient with recent rheumatic carditis. Of 15 cases treated on the fifth day, 3 died (20 per cent. mortality). Of 21 cases treated on the sixth day or later, 5 died (24 per cent. mortality). No complicating conditions of importance were present in the fatal cases in the fifth and sixth day groups. A few cases have been excluded from this analysis on the grounds of uncertainty as to the day of onset of symptoms.

The results of treatment begun during the first three days of illness are thus twice as good as the results of treatment delayed to later days. This experience is in accordance with the published data of larger series in the United States, and is comparable with the results obtained in the treatment of, for example, diphtheria by antitoxin; but it must be remembered that, other things being equal, a definitely worse prognosis must always be given when a case of pneumonia is removed to hospital after the first few days of the disease, because of the shock of removal at that critical period. The number of Type I. cases received at Selly Oak (since typing was first performed as a routine) and receiving no serum, has been too small to allow me to supply comparable figures.

The average dose of serum was, in the cases which recovered, 57,000 units, and in the fatal cases 90,000. The smallest total dose employed was 20,000, and the largest 260,000, in a case which ultimately proved fatal.

Type II. cases.‡—The number of cases treated with serum is proportionately smaller than for the Type I. cases, and too small for use as statistical evidence. Twenty cases received serum, with 6 deaths (30 per cent.); in the same period, 37 cases were admitted and received no serum (one case of meningitis is excluded), with 11 deaths (30 per cent.). Nine patients received serum before the end of the third day from onset of symptoms, of whom 2 died (22 per cent.); 9 received serum after the end of the third day, and 4 of them died (44 per cent.). The average dose of serum given in cases which recovered was 63,000 units; and to fatal cases, 75,000. The minimum total dose given was 20,000 and maximum 140,000, to a patient who recovered.

Clinical impressions of the effects of serum.—In 1933 I referred to the frequency of untoward reactions after the intravenous injection of Type I. serum (tachycardia, rigors, hyperthermia). Using a different batch of serum, such reactions have subsequently been entirely absent, and that some factor in the serum itself was primarily responsible is conclusively shown by the fact that reactions were not seen when trials were made with the original batch after reconcentration by a different method, at the Serum Department of the Lister Institute. Not all patients, however, gave reactions with the original batch, so that conditions obtaining in the patient's tissues must be held to be of some importance; reasons were given in the first paper for supposing that the reactions were not "allergic," and that therefore methods designed to "desensitise" were of no avail. No precautions to ascertain the degree of sensitivity to horse-serum were employed in the present series. Three patients treated with Type I. serum showed a mild urticaria 8–12 days after receiving serum.

Unpleasant reactions with Type II. serum, however, have been frequent, and of the same nature as those previously described for Type I., except that hyperthermia was not observed. The question arises as to what extent unpleasant and possibly dangerous reactions are connected with efficacy in therapeusis. While it is true that an immediate crisis was observed, following such reactions, in many cases in the first series, and in Type II. cases in the present series, equally spectacular results have been often seen in Type I. cases in the present series which showed no symptoms of "shock" or rigors. Subjective sensations of improvement after the first dose of either serum were usual.

I still consider that the blood culture gives the best guide both to prognosis and to the need for serum treatment. Repeated blood cultures, however, in a few of the fatal cases of both Type I. and Type II. pneumonia receiving serum, did not show pneumococci, and the reason for the failure to respond to serum in these cases is not clear. It is my opinion, and that of my colleagues also, that the clinical rules for prognosis in pneumonia are very far from being infallible, and that the blood culture, in spite of these occasional discrepancies, is a more certain guide. Abscess-formation, whether in pleura, lung, pericardium, or elsewhere, appears to mark the end of the usefulness of intravenous administration of serum, and was present in those fatal cases treated with serum but not showing septicæmia, in which post-mortem examination was allowed. Several instances of sterilisation of the blood (some only temporary) following serum treatment, were observed.

An attempt was made, following the reports of Francis,[5] to make use of intradermal reactions to capsular substance as a guide to serum dosage; the process was found to be too time-consuming for routine use, and in the few patients tested, the reactions were not sufficiently clear to afford useful information.

CONCLUSIONS

The extended use of concentrated serum in the treatment of pneumonia at Selly Oak Hospital has confirmed the earlier impressions of its value. I consider that there is a strong probability that the use of larger doses of Type II. serum, which the fear of severe reactions at present makes difficult, would produce as good results as those obtained with Type I. serum. The need for very early treatment is obvious.

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[‡] The serum employed was supplied by Messrs. Burroughs Wellcome and Co., and contained 20,000 units in about 9 c.cm.

A METHOD OF MEASURING THE AIRWAY OF THE NOSE

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Into one nostril a nipple-shaped tube is inserted so as to fit the nasal opening in airtight fashion. A glass tube, with a rubber nipple fixed on its end, answers the purpose; the orifice cut in the end of the nipple should be about 5 mm. in diameter. This tube is connected with a water manometer, the other end of the tube of the manometer is connected to a tambour set to write on a drum.

To provide a simple instrument for clinical use the drum is dispensed with, and the excursion of the meniscus—that is of the column of water in the manometer—is noted as each breath takes place through the other nostril, the mouth being kept shut.

A record of the manometric excursion produced by breathing is taken first from one nostril and then from the other. When the breathing is through a partially obstructed nostril the excursion will be greater because of the greater pull of the expanding lungs on the nostril in which the recording tube is inserted. Now the excursion of breathing through the normal nostril can be made equal to that through the partially obstructed side, by narrowing the external opening of the former. This can be effected by inserting into it a very short length of nipple-shaped tube. A number of such tubes are used, each having a different sized opening. The openings experimented with increased as follows:—

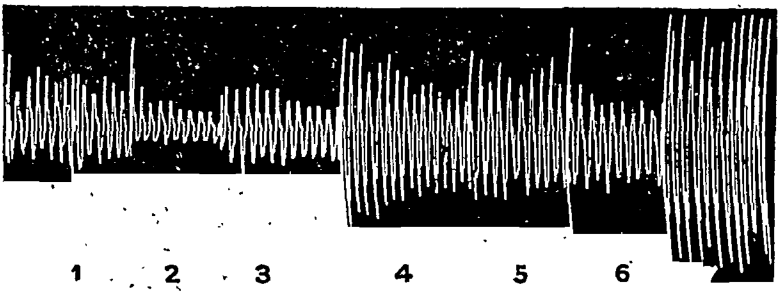

FIG. 1.—Subject T

1. Right side of nose.
2. Ditto with 28·5 sq. mm. tube, respiration easier.
3. Ditto with 19 ,, ,, ,, ,, ,,
4. Ditto with 14 ,, ,, ,, ,, increased.
5. Left side of nose.
6. Ditto with 19 sq. mm., respiration easier.
7. Ditto with 14 ,, ,, tube, respiration much increased.

The right side of the nose has naturally the freer air-passage.

Diameter.	Surface area (approximate).
2. 6 mm.	5½ sq. mm.
3. 5 ,,	9½ ,, ,,
4. 2 ,,	14 ,, ,,
4. 9 ,,	19 ,, ,,
6. 0 ,,	28½ ,, ,,
11. 0 ,,	95½ ,, ,,

In place of these tubes one tube can be used to which a slit is attached, which can be varied in width by means of a screw, a gauge being provided to indicate the size of the slit.

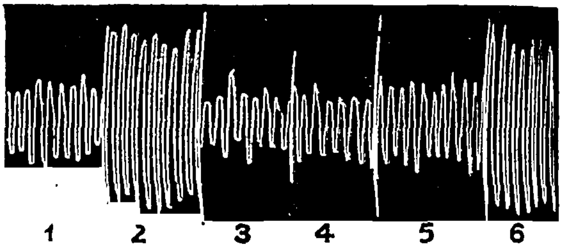

FIG. 2.—Subject L

1. Right side of nose.
2. Left side of nose (naturally partially obstructed).
3. Right side of nose with 28·5 sq. mm. tube.
4. Ditto with 19 ,, ,,
5. Ditto with 14 ,, ,,
6. Ditto with 9·5 ,, ,,

It must be borne in mind that when the recording tube is inserted into the more obstructed side of the nose the wing of the nostril is pushed out. This relieves the obstruction if this be at the ostium internum, and makes the taking of the record possible. Supposing it is found after insertion into the normal nostril of the tube, with 9½ sq. mm. opening, that the excursion of the breathing through that side becomes equal to the excursion through the partially obstructed side, then the conclusion is reached that the area of the breathing passage on the partially obstructed side is no larger than 9½ sq. mm. (*Figs.* 1 *and* 2).

We have seen that in the case of a nostril partially obstructed at the ostium internum the insertion of a tube by pushing out the wing relieves the obstruction (Figs. 1, 5, 6). The insertion of a tube can therefore be found, the orifice of which causes a breathing excursion equal to that when there is no tube in this nostril.

Next, in the case of either nostril of a subject, the tube can be found which just causes an increase of excursion obtained during quiet respiration when the subject is sitting at rest.

The size of opening sufficient for normal quiet respiration in most subjects is found to be about 14 sq. mm. When the tube of 19 sq. mm. or larger opening is inserted it makes the breathing easier by pushing out the wing (Figs. 1 and 2). A larger opening than 19 sq. mm. is required when the subject does exercise—e.g., stepping on to a box 6 inches high twelve times a minute. By increasing the exercise

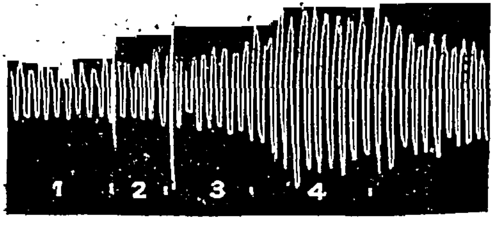

FIG. 3.—Subject H

1. Right side of nose (unobstructed).
2. With heater on no effect.
3. Right side of nose obstructed with 14 sq. mm. tube.
4. With heater on (increased excursion).

the normal nostril was found to have an opening of about 30 sq. mm.—the size of the end of a pencil.

After inhalation of a solution containing adrenaline the relief of the partially obstructed side of the nose was such that the excursion is made almost equal to that on the normal side. The method thus shows the effect of treatment. (Compare Figs. 1 and 2 with Fig. 6.)

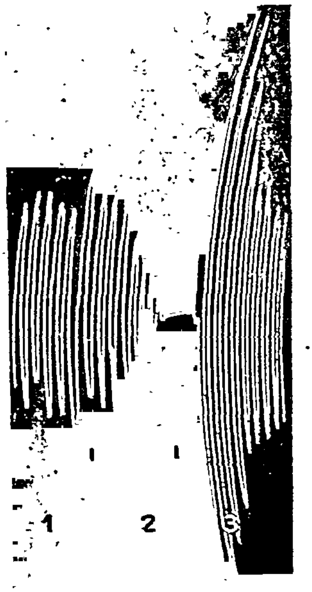

FIG. 4

1. Left side of nose (naturally partially obstructed).
2. With heater on air-way totally obstructed.
3. Respiration following turning off of heater.

An opening as small as 5½ sq. mm. may suffice, at any rate for a short time, for an adequate supply of air to the normal subject when at rest, but the excursion becomes greatly increased, the inspiration and expiration being prolonged at the height of each. In some the respiration is made less, and in others more, frequent as the result of such partial obstruction.

The irradiation of the skin with a small source of dull red heat (an electric coil 4 in. by 2) increases the partial obstruction (Figs. 3 and 4), and in about 50 per cent. of subjects the switching on of a bright source, such as a small tungsten arc, held some two feet away, or an incandescent lamp, relieves the obstruction (Fig. 5). After adrenaline inhalation the heater has no effect (Fig. 6). The method lends itself very well to the demonstration of these phenomena and to the refutation of the assertion made by Dufton and Bedford,[1] and

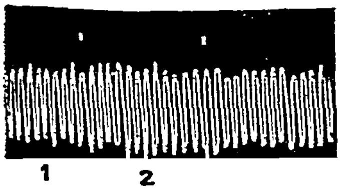

FIG. 6

1. Left side of nose after adrenaline inhalation.
2. Turning heater on had no effect.

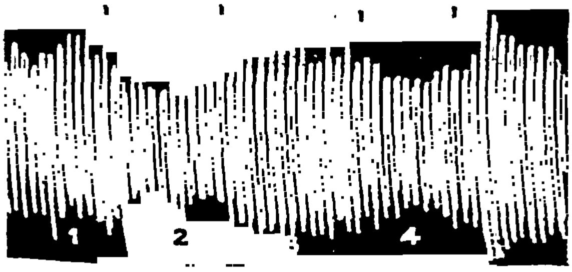

FIG. 5

1 and 3. Left side of nose (naturally partially obstructed).
2 and 4. Respiration made easier by turning tungsten arc on to the skin.

of Winslow and others,[2] that "nose opening" rays[3] do not exist. Dishoek [4] has confirmed such ray action.

In the case of one asthmatic subject it was found that a tube opening of 28½ sq. mm. produced an increase of breathing excursion, while one of 14 sq. mm. may be required to effect this in normal people. In the case of two other asthmatics one side of the nose was found to have an obstruction equal to a tube with an opening of about 5½ sq. mm. It is obvious that the effect of any operative procedure for relieving such obstruction can be measured by the method.

This research was carried out with the aid of a grant for expenses from the Medical Research Council.

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APLASTIC ANÆMIA

TWO FATAL CASES TREATED BY BLOOD TRANSFUSION AND PENTOSE NUCLEOTIDE

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These two cases are reported in view of the present interest in pentose nucleotide therapy in granulocytopenia or "agranulocytosis." In aplastic anæmia, as is well known, granulocytopenia may form part of the blood picture, in addition to diminution of red cells and platelets. In the cases here recorded an attempt was made to influence this granulocytopenia by pentose nucleotide therapy, while maintaining the red cell count at a reasonable level by blood transfusion. The attempt failed and both patients died without any real improvement having taken place.

Mills [1] divides aplastic anæmia into primary or idiopathic, and secondary groups. Primary aplastic anæmia he regards as very rare. The secondary group contains those cases which follow the administration of various toxic substances such as benzene and arsenobenzene derivatives. Excessive exposure to radiation from radium or X rays may also give rise to an aplastic anæmia. The prognosis is extremely poor in all varieties which attain any degree of severity, and although many remedies have been suggested and tried, blood transfusion seems to be the only one which has produced any benefit, and this is usually no more than temporary.

McCarthy and Wilson [2] have reported 34 cases of aplastic anæmia, 17 of which were treated by blood transfusion alone, and of these only 3 recovered—a mortality of 83 per cent. They advocated the use of pentose nucleotide as a supplement to blood transfusion, but gave no records of cases in which it was tried. Their observations referred particularly to aplastic anæmia following the administration of arsenobenzene (arsphenamine) derivatives. The first case described below was one of this kind; in the second no causal factor was discovered.

THE TWO CASES

Case 1.—A single woman, aged 30, was admitted to St. Stephen's Hospital on Sept. 22nd, 1933, with a primary labial sore which had been present for three weeks. The blood Wassermann and Kahn reactions were strongly positive. There was a slight sore-throat and headache on admission, but no rash or obvious secondary lesion. There was nothing of note in the previous history of the patient. Apart from the syphilitic primary lesion she was perfectly well. No splenic enlargement could be detected and no abnormality was found in the cardiovascular, respiratory, or nervous systems. Antisyphilitic treatment was begun, and in all nine injections of N.A.B. (neoarsphenamine) were given at weekly intervals, the first two doses being 0·45 g. and the rest 0·6 g. Nine injections of bismuth in the form of 1 c.cm. of Chlorostab were also given during the same period. These injections ended on Nov. 29th., 1933.

The subsequent course was as follows. Dec. 5th: patient developed severe bilateral quinsy, with cervical adenitis and high pyrexia; swab taken revealed streptococci, but no Klebs-Löffler or Vincent's organisms. 7th: quinsy on left side incised; other treatment consisted of hot fomentations and hydrogen peroxide and saline gargles; pyrexia still continued. 9th: some improvement in throat condition, but pyrexia was still high and patient looked severely ill and anæmic. Dec. 12th: throat improving and adenitis subsiding. 18th: blood count showed severe anæmia of normocytic type with marked granulopenia; throat still further improved but pyrexia continued. 19th: began a course of pentose nucleotide in daily doses of 1·4 g. intramuscularly; blood culture negative. Dec. 23rd: no improvement in blood picture; blood transfusion of one pint from a group II. donor; pyrexia continued; pentose nucleotide reduced to 0·7 g. daily. 27th: temperature slightly lower, and patient felt a little better, but no improvement in blood picture had occurred; slight bleeding per vaginam; pentose nucleotide stopped. 30th: blood transfusion one pint. 31st: blood transfusion one pint; patient no better and pyrexia still continued around 103° F.; no great improvement in blood picture. Jan. 1st: 1934, much worse, in a semi-comatose state. Jan 2nd: died at 1 A.M.

The blood counts are summarised in Table I.

TABLE I. (Case 1). *Blood Counts*

Date in 1933.	Red cells (millions)	Hb.	Colour-index.	White cells.	Poly-morphs.	Lympho-cytes.	Mono-cytes.	Eosino-phils.	Baso-phils.
	c.mm.	%		c.mm.	%	%	%	%	%
Dec. 18	1·51	26	0·87	2000	22·5	69·5	7·5	0·5	—
,, 19	1·52	28	0·93	1100	—	—	—	—	—
,, 20	—	—	—	3100	—	—	—	—	—
,, 21	1·40	—	—	1200	24	67	6	2	1
,, 22	1·17	22	0·96	1300	25	69	6	—	—
,, 23	1·09	20	0·91	1700	—	—	—	—	—
,, 27	1·24	21	0·84	1100	18*	74	8	—	—
1934									
Jan. 1	1·78	32	0·88	1300	—	—	—	—	—

* Reticulocytes less than 1%.

This patient received eleven injections of pentnucleotide (Smith, Kline, and French) of 0·7 g. each. For the first four days two injections per day were given, and on the remaining days this was reduced to one injection of 0·7 g.

Post-mortem Findings.—External appearances: Large subcutaneous bullæ had rapidly developed overnight, and contained hæmorrhagic serous fluid; the whole body was grossly distended by gas formation. Pharynx: some œdema and ulceration of fauces. Trachea and bronchi: mildly inflamed, contained much frothy muco-pus. Pleuræ: numerous hæmorrhagic petechiæ; each cavity contained about a pint of serous exudate. Lungs: grossly œdematous. Heart muscle: very pale and flabby. Aorta: slight fatty streaking. Liver: very pale and fatty, and honeycombed by gas. Spleen: very pale and soft but not enlarged. Stomach and intestines: nothing of note. Kidneys: very pale with much cloudy swelling. Adrenals: marked diminution of cortical lipoid. Brain: very œdematous and affected by post-mortem gas-formation.

The right femur and a rib on section revealed marked pallor and fatty infiltration of marrow. On microscopical examination the bone-marrow was seen to be almost completely aplastic, with very few leucocytes and no erythroblastic tissue. There was nothing else of note beyond toxic visceral changes. Culture of the fluid from the subcutaneous bullæ gave no growth.

CASE 2.—A Jewish girl, aged 22, was admitted to hospital on March 9th, 1934, with a history of bleeding from the gums during the previous six weeks. This bleeding had been only occasional and never severe. There had also been bruising of the skin on slight trauma during the same period. The patient felt very exhausted and had been in bed for ten days before admission. Copious vaginal hæmorrhage was the reason for her being sent to hospital. There was nothing of note in her previous history and the menses had previously been normal.

She was very pale and obviously anæmic. There was copious bleeding from the gum margins and per vaginam, and numerous ecchymoses and petechial hæmorrhages over the trunk and limbs. There was no ulceration of the mouth or pharynx, and the liver and spleen were not palpable. A generalised soft systolic murmur was audible over the precordium. Blood pressure 102/80. Examination of other systems revealed nothing of note.

The course of the events was as follows. March 9th: high pyrexia; treated by hot vaginal douches and adrenaline swabs to gums; 10 c.cm. of hæmoplastin injected. 10th: blood count; bleeding checked to some extent by local treatment. 12th: blood picture much worse; a small transfusion of six ounces was given; the gums stopped bleeding after this but the vaginal bleeding continued, though less in amount; patient still bruised very easily; pentnucleotide 1·4 g. given intramuscularly. 13th: still bleeding slightly per vaginam; blood transfusion of one pint; pentnucleotide increased to 2·8 g. daily; still high continuous pyrexia 102°–103°. 14th: blood picture considerably improved as far as red cells were concerned; bleeding entirely ceased; blood transfusion of one pint, which was followed by a slight angioneurotic œdema of the face. 15th: red cell count still further improved, but no improvement in white cell count; no further bleeding or ecchymoses. 16th: still no improvement in white cell count. 17th: commenced bleeding again from gums and vagina; blood transfusion one pint. 19th: general condition much worse; no remission of pyrexia, which ran between 103°–104°; some respiratory distress and slight signs of consolidation at pulmonary bases. 21st: patient comatose, bleeding from mouth again; died in evening.

Pentnucleotide was continued up to the day of death; and in all 21 g. were given. The blood counts are summarised in Table II.

TABLE II. (Case 2). *Blood Counts*

Date in 1934.	Red cells (millions)	Hb.	Colour-index.	White cells.	Poly-morphs.	Lympho-cytes.	Mono-cytes.
	c.mm.	%		c.mm.	%	%	%
March 10	2·10	36	0·67	1000	—	—	—
,, 12	1·46	26	0·90	770	5·5*	91·5	3·0
,, 13	2·04	32	0·8	400	—	—	—
,, 14	2·15	43	1·0	1000	10	88	2
,, 15	2·97	54	0·9	500	—	—	—
,, 16	3·37	52	0·77	670	—	—	—
,, 17	2·80	52	0·93	720	—	—	—
,, 19	2·86	54	0·95	500	—	—	—
,, 20	2·60	50	0·96	600	8	90	2

* Platelets 20,000 c.mm.

Post-mortem examination revealed severe toxic visceral changes, basal pulmonary œdema and broncho-pneumonia. The liver showed conspicuous fatty degeneration. There was pallor and fatty infiltration of the marrow in the shaft of the right femur and a rib, and histologically these showed almost complete aplasia apart from a few very scattered leucocytes.

COMMENT

The two cases showed no qualitative alteration in the red cells other than a slight anisocytosis, as is usual in aplastic anæmia. Granulocytopenia was prominent in both of them, and pentose nucleotide therapy was tried in the hope of stimulating the granulopoietic activity of the bone-marrow, but not the slightest response was obtained.

Evidence is increasing that dramatic success can be expected of pentose nucleotide therapy only in those cases of granulocytopenia attributable to a "maturation arrest" of the granulocytes of the bone-marrow.[3] In such cases much hyperplasia of the granulopoietic elements of the marrow is found, and this is in contrast to the hypoplasia or aplasia seen in aplastic anæmia. There is usually no associated anæmia, or only a very slight diminution in red cells.

If this supposition be correct the failure of pentose nucleotide in the above two cases was to be expected, for in both of them there was almost complete aplasia of the marrow. Failures in the treatment of granulocytopenia by pentose nucleotide have been recorded by Fairley and Scott,[4] Blackie,[5] Hall,[6] and Fettes and Whitby,[7] and it is probable that many of these cases were of the aplastic variety, not associated with hyperplastic changes in the marrow. In the two cases reported here the presence of severe anæmia in addition to the granulocytopenia made it necessary to give blood transfusions. It may be said that transfusion was too infrequent; but as often happens, the transfused blood was quickly destroyed and gave little benefit apart from a slight improvement in the red cell count of the second patient.

A larger number of cases is obviously necessary before any definite conclusions can be reached with regard to the use of pentose nucleotide in aplastic conditions of the bone-marrow; but in view of the uncertain ætiology of many of these conditions it seems to be worth a trial.

My thanks are due to Dr. T. W. Griffiths and Dr. G. Goodhart for their kind coöperation.

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APLASTIC ANÆMIA FOLLOWING NEOKHARSIVAN

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Among the untoward results of the treatment of syphilis by the organic arsenical preparations aplastic anæmia and the other blood dyscrasias seem to have received very little attention in this country. Nevertheless, although rare, they are well recognised, especially in America, where McCarthy and Wilson[1] in 1932 published an analysis of all the available recorded cases and added 2 from their own observation. Bickford and Tilghman[2] in 1933 recorded 2 non-fatal cases of purpura hæmorrhagica occurring during the treatment of congenital syphilis with neoarsphenamine, and Scarf[3] (1934) a case of aplastic anæmia with recovery also following neoarsphenamine. These conditions are rare and McCarthy and Wilson were able to collect only 79 cases in all. Cole and his co-workers[4] (1931) observed only 2 cases in a total of 338 complications arising in the treatment of 1212 patients over a ten-year period, Phelps[5] had 2 cases in 272,354 injections, and Combes[6] 1 in 4000 patients.

CLASSIFICATION AND CLINICAL FEATURES

The classification of these conditions of the blood has always presented difficulties, for they all appear to be due to greater or less depression of the bone-marrow, but it seems that this depression may affect the various formative functions in varying degree and the provisional classification suggested by Kennedy[7] is likely to prove as useful as any. The importance of being able to classify a case is that the prognosis and treatment vary in the different types.

The suggested groups are: (1) thrombocytopenic, (2) granulocytopenic and agranulocytic, and (3) aplastic. A few cases are atypical and defy exact classification. Of the 79 cases referred to above, 65 fell into one or other of the three groups in the following proportions:—

—	I. Thrombocytopenic.	I. (sub-group). Thrombocytopenic and granulocytopenic.	II. Granulocytopenic and agranulocytic.	III. Aplastic.
Cases ..	12	7	12	34
Died ..	0	1	4	28

(Seven cases were placed in Sub-group I. because they showed granulocytopenia; one case, where this was marked, proved fatal.)

In Group I. purpura and external hæmorrhage are constant symptoms and occur within a few days of the last injection. The patients have usually received a considerable dosage, the average number of injections in the above series being 23. Anæmia is seldom severe, reduction of platelets being the striking feature. In Group II., the agranulocytic group, fever and necrotic angina of the pharynx are the commonest signs; they tend to appear after relatively few injections and within a few days of an injection. There is only very slight lowering of the red cell count, the damage being apparently confined to the granulocytes and granulopoietic tissues. Group III., the aplastic, is the largest. In these cases all the hæmopoietic functions of the marrow are depressed. The early clinical manifestations are generally purpuric, bleeding from a mucous surface being very common. In a few cases, however, extreme pallor and weakness are the only signs. Aplastic anæmia appears as a rule only after a large number of injections, at an interval varying from two hours to over one month. A large proportion of the cases are fatal (in McCarthy and Wilson's series the death-rate was 83 per cent.) but the illness usually lasts a considerable time.

HISTORY OF A CASE

A. B., a motor-bus driver aged 29, was admitted to the Royal Infirmary, Glasgow, on May 18th, 1933, complaining of increasing weakness and pallor. He stated that during the past six weeks he had been easily tired, suffered from breathlessness on exertion, and had become extremely pale. It was ascertained that the *Spirochæta pallida* had been isolated from a small genital ulcer and that anti-syphilitic treatment had been instituted on Nov. 8th, 1932. The treatment consisted of 5·85 g. of Neokharsivan in 13 injections, 2·2 g. of bismuth metal, and Hutchinson's pill (dosage unspecified). On April 21st, 1933, four weeks after the last injection, he was found to be feverish and unwell and thereafter he became steadily weaker and paler.

On admission to hospital, apart from extreme pallor and a soft systolic apical murmur, physical examination was negative; the Wassermann reaction was negative.

there was no sign of purpura and no history of hæmorrhage. The blood count was as follows :—

Red cells	1,260,000	Polymorph	54 %
White cells ..	2,600	Lymphocytes ..	43 %
Hæmoglobin ..	20 %	Eosinophils	1 %
Colour-index ..	0·8		

There were no nucleated red cells, no reticulocytes, and in *fact no evidences of marrow activity. Platelets were very* scanty. Indirect van den Bergh reaction showed 0·25 unit of bilirubin.

The condition of the blood during the patient's stay in hospital is summarised in the accompanying Table.

Table showing Blood Count

Date in 1933.		Red cells in millions.	White cells.	Hæmoglobin.	Reticulocytes.	Transfusion.
				Per cent.	Per cent.	c.cm.
March	18	1·26	2600	20	0	—
May	24	0·84	2200	17	0	—
,,	28	1·09	1600	15	0	200
,,	29	1·12	1400	23	0	—
June	2	1·04	2800	17	0	—
,,	7	1·50	3800	15	0	200
,,	8	2·16	3200	25	0	—
,,	23	1·48	3200	20	0	240
,,	24	1·31	2000	20	0	—
July	6	1·20	3400	15	0	500
,,	7	1·70	2600	25	0	—
Aug.	11	1·13	1400	20	0	700
,,	12	2·08	2200	32	0	—
,,	28	1·66	3200	28	0	500
,,	30	1·96	2200	38	0	—
Sept.	12	2·98	4200	42	8	—
,,	25	4·01	7600	70	5	—

Improvement was very slow, but ultimately, on Sept. 25th, 1933, a blood count showed :—

Red cells	4,000,000	Polymorph	39 %
White cells	7,600	Metamyelocytes ..	7 %
Hb.	70 %	Myelocytes	4 %
		Lymphocytes ..	47 %
		Large mono.	3 %

The patient was dismissed on Oct. 10th, 1933, and has remained well so far as is known. In the early stages of the illness platelets were very scanty in the films but increased in number as the blood improved. In the course of treatment, in addition to blood by transfusion, Blaud's pill up to grs. 30 t.i.d., liq. arsenicalis up to ♏ 5 t.i.d., Campolon, Hepatex, whole liver and thyroid extract were administered. It was interesting to note that the appearance of reticulocytes in considerable numbers coincided with the administration of thyroid extract. During the earlier stages of the illness there was no evidence of marrow activity and life was maintained mainly by blood transfusions; eventually, however, the bone-marrow apparently resumed its hæmopoietic activities and the blood improved. It is suggested therefore that the case is to be regarded as one of aplastic anæmia caused by the depressing effect of neokharsivan on the bone-marrow and that it belongs to Group III. of the suggested classification. The volume of the earlier blood transfusions was small owing to difficulty in obtaining suitable donors.

MECHANISM OF PRODUCTION

These various blood dyscrasias so far recorded have occurred most frequently after the administration of neoarsphenamine; but this is probably because the drug is used more extensively than any other; in fact many authorities [8] regard sulpharsphenamine as much more dangerous in this connexion. All the organic arsenical preparations commonly used in the treatment of syphilis contain the double benzene ring and as the aplastic anæmia following these drugs closely resembles that occurring in benzene poisoning, most observers are of the opinion that the anæmia is caused by the action of the benzene group. The development of agranulocytosis and thrombocytopenia is more difficult to explain; the former may perhaps be due to a selective depressant action of the drug on the granulopoietic tissues. McCarthy and Wilson suggest that thrombocytopenia may be anaphylactoid in nature; all their cases had many injections and they consider that a sensitivity to the arsphenamines may develop gradually, and that the platelets are destroyed in the peripheral circulation. Support is given to this view by the rapid regeneration of platelets after the injections are stopped and also by the fact that in a few cases symptoms recurred whenever treatment was recommenced.

Whatever the exact mechanism of production may be, it is apparent that the organic arsenical drugs used in the treatment of syphilis can act as powerful poisons to the bone-marrow and further that their toxic action may not become manifest until several weeks have elapsed after the cessation of treatment.

TREATMENT

In the thrombocytopenic group no special treatment is required beyond discontinuing injections, for almost all the patients recover spontaneously within a few days. Where agranulocytosis or marked granulocytopenia is a feature blood transfusion is said to be of doubtful value. There appears to be no record of treatment by drugs such as pentose nucleotide, but in view of their value in other cases of agranulocytosis they should certainly be given a trial. In the aplastic cases blood transfusion frequently repeated is the only remedy with any prospect of success. Prevention is better than cure, however, and purpuric symptoms or pallor appearing during the treatment of syphilis should be regarded with grave suspicion and lead to the arsenical drugs being stopped at once.

I am indebted to Prof. W. K. Hunter for permission *to publish the notes of this case.*

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The reader is referred to the admirable paper by McCarthy and Wilson for a full bibliography of the cases recorded up to 1932.

PURPURA HÆMORRHAGICA CAUSED BY GOLD AND ARSENICAL COMPOUNDS

WITH A REPORT OF TWO CASES

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The idiosyncrasies shown to the compounds of gold and arsenic are very similar. Both drugs commonly affect the skin and digestive system; less often they attack the hæmopoietic system, causing a reduction in the number of platelets, prolongation of the bleeding-time, and hæmorrhages, particularly from the uterus and nose. Purpura hæmorrhagica and agranulocytosis are rarer sequels.

GOLD PURPURA

Weil [1] states that the first case of gold purpura was reported in 1919. Since then others have appeared at intervals, chiefly in France, and examination of accounts of 21 of the recorded cases shows that they can be divided into two main groups :

(A) Purpura unassociated with any strong hæmorrhagic tendency. These cases recover spontaneously on stopping the injections.[2, 3]

(B) Hæmorrhagic purpura involving the whole body surface. In this type there is profuse bleeding from the mucous membranes and particularly the uterus.

The following is an account of a case of purpura precipitated by the small initial dose of a second course of aurotherapy.

CASE 1.—The patient, a woman of 21, was admitted to the Victoria Park Hospital in March 1931, under the care of Dr. F. G. Chandler, suffering from bilateral pulmonary tuberculosis. On April 9th an artificial pneumothorax was induced on the right side, and on June 10th Dr. Chandler divided an adhesion. In May and June weekly injections of 0·1, 0·1, 0·2, and 0·2 g. of Allochrysine, a total of 0·6 g. had been given. The course was not completed because of the febrile reaction ascribed to the operation. She was sent to a sanatorium.

In February, 1932, the right lung was well collapsed, but a small cavity was seen in the left upper zone. On readmission for a course of intravenous Crisalbine she was apyrexial, but the sputum contained tubercle bacilli. On March 3rd the first dose, 0·05 g. of crisalbine, was given, the only reaction being a rise in temperature from 97·2° to 98·6° F. the next day. She felt perfectly well for the next two days, and her temperature was 97·4°. On March 6th petechiæ and ecchymosis were noticed round the site of the injection and in the evening she had a profuse epistaxis.

On March 7th a fine purpuric rash appeared all over the trunk, arms, and legs; there were also petechiæ on the tongue, lips, and nasal mucosa. There was free bleeding from the gums and a large bullous hæmatoma in the buccal mucosa. The fundi were normal, the liver and spleen were not enlarged. The stools contained a large quantity of dark blood. The urine contained no blood or albumin. The temperature was 98·6°, and the pulse-rate 100. The catamenia had started on March 5th, although not expected until the 8th. The loss was profuse and lasted a fortnight instead of the usual four days.

The patient was given glucose 4 oz. daily, Liveroid ½ oz. three times a day, and minced liver ½ lb. daily by mouth; also six injections of 20 c.cm. horse serum together with 2 c.cm. hæmostatic serum intramuscularly at six-hourly intervals. On March 8th and 9th she had a profuse epistaxis but no fresh petechiæ. An injection of 3 c.cm. of 10 per cent. solution of calcium chloride was given intravenously. On March 10th there were many fresh petechiæ: temperature 99·4°, pulse-rate 104–120. On the 11th the vaginal loss was more profuse, and two further doses of hæmostatic serum and horse serum were given. In the evening her condition became much worse, and a transfusion of 500 c.cm. of citrated blood, Group II., with 50 c.cm. of 25 per cent. glucose was given, the donor being the patient's sister. From now on there were no fresh petechiæ the oral bleeding stopped, and the patient made slow improvement until her vaginal loss ceased, after which she improved rapidly. The blood counts are shown in Table I.

Outcome.—The tuberculosis advanced steadily and the patient died from this nine months later, there having been no recurrence of purpura.

ARSENOBENZOL PURPURA

Bamforth and Elkington[4] in 1931 reviewed 15 recorded cases of arsenobenzol (arsphenamine) purpura, the first of which appeared in 1917; they also reported 4 of their own. The second case is strikingly similar to the case of gold purpura described above.

The patient, a man aged 40, was admitted to the West London Hospital in March, 1931, under the care of Dr. J. Burnford. He had an aneurysm of the aorta and the axillary artery, and his Wassermann reaction was strongly positive. Potassium iodide grs. 30 daily was given by mouth and intramuscular injections of Sulfarsenol (sulpharsphenamine). A total of 4·3 g., given between Jan. 11th and March 28th, completed the course. Four hours after the final injection of 0·6 g. he noticed a rash on his arms and legs. Toxic symptoms had not been observed up to this time, though he later admitted that he had felt unwell after the last four injections.

On admission to hospital on March 30th the distribution and extent of the lesions was almost exactly the same as in the case of gold purpura. The extravasation of blood round the site of the last injection was very extensive. The patient was bleeding freely from bullous hæmatomata in the buccal mucosa. Neither the liver nor the spleen was palpable, the fundi were normal, and the urine contained a trace of arsenic but no albumin or blood. Intravenous glucose (50 c.cm. of 25 per cent. solution) was given on admission. Liver. Liveroid, Coagulin Ciba (2½ per cent. solution by mouth), and hæmostatic serum by injection had no apparent effect in arresting the hæmorrhage, and fresh purpura appeared until a blood transfusion was given, after which all bleeding ceased within a few hours and he made a rapid and uneventful recovery. The blood counts are seen in Table II.

Outcome.—In May, 1935, his private doctor, Dr. J. A. Butler, wrote: "The patient is tolerably well; the aneurysm has not apparently progressed and there has been no jaundice or symptom of injury to the liver.

TABLE I.—BLOOD COUNTS IN CASE 1

Date.	Red cells.	Hæmoglobin.	Colour-index.	White cells.	Polymorphs.	Basophils.	Eosinophils.	Lymphocytes.	Monocytes.	Myelocytes.	Punctate basophilia.	Nucleated red cells.	Platelets.
March 9th	4,900,000	65 %	0·66	17,000	83 %	0·5	..	13 %	3 %	0·5 %	Marked.	None seen.	Only 3 or 4 seen.
„ 11th*	..	..	..	..	..	..	..	..	..	..	..	..	..
„ 22nd	3,800,000	62 %	0·8	16,000	73 %	1 %	4 %	13 %	8 %	1 %	Present.	None seen.	Numerous in large clumps.

* Blood transfusion 500 c.cm. citrated blood Group II.

TABLE II.—BLOOD COUNTS IN CASE 2

Date.	Red cells.	Hæmoglobin.	Colour-index.	White cells.	Polymorphs.	Eosinophils.	Monocytes.	Lymphocytes.	Myelocytes.	Reticulocytes.	Polychromasia.	Nucleated red cells.	Platelets.
March 31st	3,000,000	42 %	0·6	24,000	87 %	1 %	2 %	10 %	0	0	Slight.	None seen	None seen.
April 1st*	..	33 %	..	20,160	91 %	0	0	9 %	5·7 %	0	Slight.	—	None seen.
„ 2nd	2,000,000	30 %	0·75	30,000	95 %	0	0	3 %	2 %	3 %	—	Occ.	Occ.
„ 4th	1,780,000	22 %	0·64	16,000	80 %	1 %	..	7 %	12 %	..	Marked †	None seen	None seen.
„ 8th	2,000,000	25 %	0·6	12,000	85 %	1 %	..	14 %	..	..	Marked.	..	90,000
„ 24th	3,300,000	42 %	0·65	8·600	78 %	3 %	5 %	14 %	..	4·8 %	Slight.	..	126,000

* Blood transfusion 650 c.cm. Group III. † With punctate basophilia. Occ. = occasional.

The uterine condition was treated by intravenous injections of Trypaflavine and Novalgin combined with glycerin and Protargol vaginal tamponage. It improved rapidly, but the joint affection gradually became worse. On March 9th she received dental treatment for a marginal gingivitis, but still the joint condition progressed.

On April 28th the patient was referred to me as a case of gonorrhœal arthritis. When I first saw her she was lying in bed with both knees fully flexed, thighs flexed on the abdomen, and ankle-joints extended. The muscles of thighs and calves were markedly wasted. The right arm was flexed at the elbow, and wrist and hand were in the claw position. She was greatly emaciated and utterly miserable. There was complete incontinence of fæces and urine. I was unable to move any of the joints affected on account of spasm and pain. Movement under anæsthesia was contra-indicated because of the risk of fracturing the bones. It was considered that the origin of the disease was much more deeply seated than a mere polyarthritis, and accordingly her cutaneous sensations were tested. Owing to the lack of coöperation of the patient the tests were unsatisfactory but sufficient evidence was available to prove paræsthesiæ of both legs and arms.

Next day lumbar puncture was performed. The first tap was made between the 2nd and 3rd lumbar spines, but no fluid dripped from the needle. The 1st lumbar space was then tried with similar result and the 3rd space was tapped, still with negative result. A syringe was attached to the needle and about 2 c.cm. of cerebro-spinal fluid was aspirated with difficulty. The Wassermann and Kahn tests on the fluid were both negative. The fluid was clear, giving a cell count of 2 to 4 per field, chiefly lymphocytes. The total protein was 50–55 with only a trace of globulin.

A tentative diagnosis of chronic adhesive meningitis was made. In order to clear up the diagnosis cisternal pucture was performed on May 2nd under local infiltration and 5 c.cm. of lipiodol was injected. The patient was propped up in the erect attitude for 20 minutes and a radiogram taken. Her condition was very poor during this period. The pulse was rapid and there was profuse sweating and general symptoms of collapse. She recovered somewhat after return to bed, the head being propped up to prevent the lipiodol gravitating to the brain. The following day her general condition had improved, but she complained of severe pain on the right side of the head, neck, and body.

The radiogram showed a block in the subarachnoid space between the 1st and 4th lumbar vertebral levels. The block was incomplete, showing a ragged lower margin and a fine hair-like canal leading down to the level of 3rd lumbar vertebra, thus permitting some of the lipiodol to pass down into the sheaths of the nerve-roots.

I did not see the patient on the day after the lipiodol injection, but on the second day after it I was astonished to find her lying flat on her back with the legs fully extended and flaccid. In this short space of time a marked spastic paresis had been transformed into a flaccid paresis, but most important of all, she had regained complete control of her sphincters, both vesical and rectal. From now on her general condition improved rapidly and her outlook became much more cheerful.

The muscle reactions to galvanic and faradic stimuli were tested and all muscles were found to give a slight reaction, especially to faradic stimuli. The patient was instructed constantly to attempt to move her limbs, and on May 6th she was able to flex the knee and thigh ever so slightly. This fact, however, had an obvious psychological effect on her and she thereafter became a willing coöperator in the treatment. Massage and electrical treatment were given twice daily, and in addition she was put on an iron tonic. The control of the sphincters was maintained except occasionally when the bowels were very loose. On May 21st a set of pulleys was fixed to the foot of the bed and a foot-plate with cord attached was bandaged to the sole of each foot. A weight of 2 lb. was attached to each cord and the patient was advised to flex the legs against the suspended weights. The muscular tone and power increased rapidly under this régime. In addition to the leg movements she was now able to move the right arm freely, although coördination as tested by touching the tip of the nose with the eyes closed was deficient. She put on weight rapidly and was completely changed from her former inert picture of misery to a cheerful and alert person.

On June 3rd—that is one month after the injection of the lipiodol—she was able to sit up in bed and feed herself with solid food, which she had been unable to do for months. The power and coördination of her arm did not, as yet, permit her to carry liquids to the mouth. Two weeks later she was able to walk round her bed holding on to the frame. She still complained of a feeling of weakness and pain on the right side of the neck and right half of the body. I believed the pain to be due to a form of muscular rheumatism, from the long period of disuse, and put her on small doses of sodium salicylate, tincture of opium, and digitalis which appeared to produce considerable improvement.

On July 6th she was able to walk about the ward with the aid of crutches. As she did not appear to improve much after this period, I decided to try the effect of repeating the lipiodol. Consequently, on July 19th the cisterna magna was again punctured and 5 c.cm. of lipiodol injected. The patient showed no signs of distress on this occasion. She was again radiographed and the canal was seen to have opened up considerably although the outline in the lumbar region was still somewhat ragged and there was still a constriction opposite the 4th lumbar vertebra. She was confined to bed for three days after the injection and then allowed up. Progress was now rapid and uninterrupted. She walked out of the hospital, discharged, on August 18th. Her weight on July 29th was 56 lb., and on the day of discharge 68 lb.

THE SECOND CASE

A male Tamil, aged 20, was admitted to hospital on July 6th with a history of having fallen from a tree a distance of about twenty feet. He had lain unconscious in the rain for some hours before being picked up. On admission he had abrasions on the inframaxillary region, great pain in the epigastrium, and tenderness at the base of the thorax and right hypochondrium. The abdomen was slightly distended, but there was no loss of liver dullness. The alæ nasi were moving synchronously with respiration.

I was called to see the case as a possible rupture of the liver, but decided from clinical examination that the condition was concussion of the spinal cord. The patient was kept quiet with morphine, and rectal and hypodermic salines were administered to counteract shock. On the second day after admission the temperature rose to 104·5° F., with respirations 38 and pulse-rate 120, and he had a rigor. This sequence recurred the following day, and on examination of the lungs both bases were found to be dull with fine crepitations. His breathing became very laboured and a pleuritic rub developed. Fluid appeared in the right pleural cavity and his condition became so alarming that his relatives were sent for. The chest was aspirated and 200 c.cm. of fluid resembling pure blood was removed. His general condition gradually improved, but on July 16th he developed frequency of defæcation and was constantly asking for the bed-pan. Two days later he had difficulty in passing urine and had to be catheterised. The following day he became incontinent of fæces with retention of urine and complained of weakness in the right leg. At this period he was very morose, and would not speak nor answer questions.

On July 19th lumbar puncture was attempted but resulted in a dry tap, and because of his condition no further attempts were made on this occasion. On July 29th lumbar puncture was repeated first in the 1st lumbar space, then in the 2nd, but both resulted in a dry tap. The 4th space was next tried with similar result, but with the aid of an aspirating syringe five drops of yellowish-green pus were obtained. This material was sent to the bacteriologist who returned his findings as Gram-negative bacilli of unknown strain.

Having recollections of our previous case I decided to try the effect of lipiodol via the cisterna magna and this was done under local anæsthesia on August 1st. Five c.cm. was injected and a radiogram taken. This showed the lipiodol scattered about in small globules instead of forming a solid mass outlining the spinal theca. Meanwhile, the loss of control of the sphincters had continued, but on August 3rd—that is two days after the injection of lipiodol—he was able to pass water by himself, although for a few days after, the catheter had to be passed occasionally. Thereafter he regained complete control of bladder and rectum and he began to move the right leg.

The patient was put on a highly nutritive diet with cod-liver oil and tonics and improved rapidly. By August 24th he was walking about with the aid of crutches, and a week later he was able to walk unaided although there was still some weakness and a consequent limp with the right leg. He was discharged from hospital fit on Sept. 15th, able to walk freely but with some weakness of the right leg on running.

COMMENT

These two cases appear to open up a new field in the treatment of subacute and chronic infections of the spinal meninges. In my opinion the good results of injecting lipiodol are due to a chemical inflammation superimposed on the chronic condition, causing absorption of the adhesions, and of any blood clot or pus present, with relief of the œdema of the nerve-roots. Lumbar or cisternal puncture is always followed by a reaction in the cerebro-spinal fluid, but judging from the almost immediate benefit in both these cases after the injection of lipiodol, I am convinced that the iodised oil was the primary factor in producing a return to health.

According to a recent paper by Vincent, Rappoport, and Berdet,[1] remarkable results have been obtained in such conditions as traumatic injuries to the meninges by the simple injection of air by the lumbar route. By this method they claim 70 to 80 per cent. cures in post-traumatic vertigo and headache. In traumatic epilepsy good results have also been obtained. In the encephalopathies of infants, encephalitis, tabes, and general paralysis the results are negative. In their opinion the passage of air in the subarachnoid space dilates the space by mechanical pressure where the canal is narrowed by adhesions. This permits the reduction of œdema which results from congestion, due to kinking of the vessels, particularly the veins, by the adhesions, thus allowing a return to normal of the cerebro-spinal fluid and vascular circulation. According to Craig,[2] lipiodol should not be used in frank inflammatory lesions because of the irritative action on the meninges. I have not had an opportunity of trying lipiodol in pathological lesions of the cerebral meninges, but I would not hesitate to make use of it in selected cases, since Laruelle has used it in a number of cases for encephalography for diagnostic purposes, without untoward results.

SUMMARY

Two cases of localised chronic inflammatory meningitis are reported, both having a certain amount of paresis with loss of control of rectal and bladder sphincters. In both of them lipiodol was injected into the cisterna magna primarily for diagnostic purposes, and in both of them the symptoms were alleviated in an almost miraculous way, with complete cure later.

I have to acknowledge my thanks to Dr. Apparajoo for his careful records and attention to the patients, and to Dr. J. S. Webster, radiologist, General Hospital, for the radiograms.

Since completing this report I have found a reference by Barré[3] to a case of arachnoiditis in which Guillain obtained excellent results by a single injection of lipiodol. No further particulars are given and I am unable to obtain the original paper.

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CLINICAL AND LABORATORY NOTES

A CASE OF BOTULISM

WITH A NOTE ON THE BACTERIOLOGICAL EXAMINATION OF THE SUSPECTED FOOD

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In view of the rarity of botulism a brief record of the symptoms, signs, and course of the first of the present series of cases, together with the subsequent confirmatory investigations, may be of interest.

A woman, aged 50, was admitted to hospital on August 5th with a history of having eaten some vegetarian nut brawn at 9.30 the previous night. On the morning of admission at 9 A.M. she was found by her brother in a rather dazed condition. The patient complained that she was unable to see clearly or talk normally, and later she had difficulty in swallowing. She also vomited and had several fainting attacks. The bowels were opened once in the course of the morning, but there was no diarrhœa. Her brother, aged 69, also took some of the same food but not as much as his sister.

On admission in the afternoon the patient was obviously distressed and cyanosed but had no pain. Her temperature was 97° F., pulse 65, and respirations 20. She answered questions only with the greatest difficulty. There was an obvious bilateral ptosis and the eyelids had to be lifted to see the state of the pupils. Strabismus was marked, the left eye looking downwards and outwards, the right eye looking directly outwards. The pupils were centrally situated, medium and equally dilated. The left pupil reacted to light normally but the right one only very sluggishly. The seventh nerve was unaffected. The soft palate was paralysed. The knee-jerks were present and the plantar reflexes flexor. There was no obvious enlargement or dilatation of the heart; the sounds were feeble and there were no bruits. The movements of the chest were irregular, spasmodic, and incoördinated. The bases of both lungs were dull to percussion and over these areas moist râles could be heard. There was no localised mass or tenderness in the abdomen.

Taking into account the definite physical signs present, together with the history of having eaten the particular food mentioned, botulism was diagnosed. Although the extreme rarity of the disease was fully realised, a special messenger was sent to obtain some anti-botulinus serum from the special department of the Ministry of Health at Colindale, and the medical officer of health was informed forthwith.

The patient's condition became rapidly worse. Her cyanosis increased, air-hunger set in, and the pulse increased to 120 beats per minute before she died 23 hours after ingestion of the suspected food—9½ hours after the first symptom made itself manifest.

DISCUSSION

In arriving at such a diagnosis the possibility of bacterial food poisoning had to be excluded. The absence of diarrhœa and the presence of the definite signs were sufficient to do this. The diagnosis of encephalitis lethargica or poliomyelitis was unlikely owing to the absence of fever; moreover, consciousness until three-quarters of an hour before death, from an infection in the brain sufficient to account for such marked cranial nerve signs, would hardly be possible in a true encephalitis. Again an encephalitis of so fulminating a type would more likely be of the hyperkinetic than the amyostatic hypokinetic and somnolent varieties. No history of the patient having taken any drugs could be obtained.

The incubation period in this case seems to be shorter than the average time quoted by G. Leighton (1924) in the Loch Maree cases. The shortest period before the onset of symptoms in that series of eight cases was 14 hours, while death occurred in 17 hours in one case, the duration of the disease was longer in the other cases. The statement that vomiting denotes an unusually heavy dose of toxin and usually presages a fatal termination (Mathews [1]) seems to be well borne out in this case.

The brother had a heart attack and died soon after hearing of the death of his sister. Shortly before he died he complained that he was unable to speak properly and that his voice seemed unfamiliar to him. At that time there were no ocular symptoms. The difficulty in speech may be significant as he stated quite definitely that he had not taken so much of the suspected food as his sister had. Symptoms of the disease would thus be expected to appear later in his case but might have been masked by the obvious mental distress and precordial pain.

BACTERIOLOGICAL INVESTIGATION

The food consisted of a number of vegetables, including peas, and particles of carrot and other unrecognisable vegetable material. As it was believed that experiments designed to prove the presence of toxin in the food itself were being undertaken at the request of the food inspector, and as only a small quantity of the food was available, it was decided to attempt to grow *B. botulinus* from it and not to attempt to prove the presence of the toxin.

A portion of the food was emulsified in sterile normal saline. The resulting suspension was heated to 80° C. for half an hour, and then thoroughly mixed with melted glucose nutrient agar and glucose nutrient gelatin and grown anaerobically at room temperature. The weather was very warm at this time and growth was obvious in three days although there was not much gas production.

Subcultures were made into glucose nutrient broth. No growth took place in this, possibly because the weather was now much cooler, although some growth must still have been possible as the gelatin cultures which had not liquefied during the first three days liquefied during this period. Subcultures were now made into human serum glucose nutrient broth and incubated anaerobically at 37° C. Growth was apparent in two days and a fresh glucose agar shake put up at the same time showed growth with disruption of the medium.

The serum broth cultures were allowed to grow for a week and then filtered through an L 5 candle. Nine guinea-pigs were injected: one with 1 c.cm. of the serum glucose broth used for preparing the toxin and incubated anaerobically in the same jar as the cultures were grown in; one with 1 c.cm. of undiluted toxin; one with 1 c.cm. of toxin diluted 1 in 100 with normal saline, another with 1 c.cm. of 1 in 1000 toxin, and another with 1 in 10,000 toxin. Four other guinea-pigs were injected with like amounts of toxin and toxin dilutions, and in addition 2 c.cm. of polyvalent anti-botulinus serum obtained from Burroughs Wellcome and Co.

All guinea-pigs given serum survived, as also did that injected with the control serum broth. Those inoculated with 1 c.cm. of undiluted toxin, 1 c.cm. of 1 in 100 and 1 c.cm. of 1 in 1000 toxin died within 18 hours. That inoculated with 1 in 10,000 toxin died in 2½ days, death being preceded by dyspnœa, loss of resistance of abdominal muscles, and paresis of the hind limbs. At post mortem none of the animals that died showed any obvious signs except congestion of the superficial cerebral vessels.

No attempt has yet been made to determine the type of *B. botulinus* responsible as so far it is not certain that the growth is pure.

We are indebted to Dr. A. J. Scott Pinchin under whose care the patient was admitted for permission to publish this case; also to Dr. C. Kitkat for information of the earlier condition of the patient and for sending the suspected food to the hospital.

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[1] Mathews, John: A Text-book of the Practice of Medicine, fourth edition, London, 1934, p. 421.

SEPTICÆMIA DUE TO BACILLUS FÆCALIS ALKALIGENES

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A fair number of cases of infection by *B. fæcalis alkaligenes* have been described. As a rule it seems to simulate infection by the typhoid-paratyphoid group. Gracey [1] records two cases from Malaya.

Case A.—Female aged 26. History of three days' fever and vomiting. Patient was six months' pregnant, and labour set in five days after admission. This was followed by rigors and high temperature. Metastatic abscesses developed in the left thigh and left side of the neck. Two months later blood culture gave a growth of *B. fæcalis alkaligenes*. The Widal reaction was negative and the patient ultimately recovered.

Case B.—Patient was a man aged 26, with swelling of the testicle and epididymis of four days' duration. Abscess of the testicle followed a fortnight afterwards. Examination of the blood and stools was negative. A week later blood culture showed *B. fæcalis alkaligenes*. Similar growth was obtained from the pus of the testicular abscess. Blood-serum from the patient gave positive agglutination against typhosus O up to a dilution of 1–200. This patient also recovered.

Zinsser and Russell [2] quote a case of severe gastro-enteritis as due to this organism, and Gatewood [3] records a case of meningitis in which it was isolated from the cerebro-spinal fluid. The meningitis had followed a cranial operation for a traumatic cyst of the brain due to a fracture of the skull and the patient recovered. Slaboziana and Nasta [4] record fatal peritonitis in twins.

One died 36 hours after delivery and the other when 5 days old. The organism was obtained from abdominal puncture during life. At the autopsy on one of them there was found peritonitis with adhesions, and infarction in the stomach and spleen, but no lesion of the intestine could be made out. Before the confinement the mother had been healthy and labour was normal. The Widal reaction of the blood-serum was negative to typhoid, paratyphoid A, B, and C, and Gaertner, aertrycke, and Morgan bacilli. It is concluded that a saphrophytic organism in the mother had become pathogenic in the fœtus.

Anderson[5] reports two cases which simulated rheumatic fever; there was a previous history of rheumatism in both, but they did not respond to salicylates. Blood cultures yielded *B. fæcalis alkaligenes*, and the patients made complete recoveries.

The case which came under our observation was that of a woman aged 33, the wife of a pig-breeder. The illness followed upon the labour of a first pregnancy. Delivery had been by forceps. After the confinement and while still in the nursing-home she developed a cracked left nipple. She was discharged from the nursing-home in fourteen days, but after her discharge the left breast became painful and swollen and there was irregular fever.

A month after the confinement she was admitted to hospital with a temperature rising to 100° F. in the evening accompanied by slight headaches. The left breast was œdematous with a small fluctuating mass in the centre of the œdematous area. The breast was opened three days later when a little thin serous pus was obtained. Rubber drains were inserted, but the expected improvement did not occur and very little pus drained from the wound. The temperature became higher and more irregular (99–105° F.) with rigors. The left breast was again opened and drainage-tubes inserted in the fascial space underneath the breast proper. No pus was obtained and none came away in the drainage-tubes. Fluctuating temperature and rigors continued. Erythematous areas appeared over the left arm, shoulder, back, and groin, suggestive of erysipelas but with no raised margins. These yielded to treatment with glycerin and ichthyol. Slight delirium developed in the evenings. The liver and spleen were not palpable and no tenderness or rigidity in the abdomen was evident. There was no suggestion of enteritis nor of uterine infection at any time during the illness. At various times she had treatment by Collosol iodine, intravenous Mercurochrome, and intravenous glucose. The temperature fell by lysis and a month after admission it was normal; but the operation wounds in the left breast still discharged thin serous pus in small amount.

Throughout the illness there was no abnormality in the urine except a slight trace of albumin and a few epithelial casts. Ten days after admission a blood count showed:—

Red cells ..	2,700,000 per c.mm.	Polymorphs ..	80 %
White cells ..	25,300 per c.mm.	Lymphocytes ..	18 %
Hæmoglobin . ..	43 %	Basophils ..	2 %
Colour-index . ..	0·8	Eosinophils	2 %

Culture from the blood at the same time gave a pure growth of coliform bacilli having the following characteristics: very faint motility; no fermentation in glucose, maltose, mannite, lactose, sucrose, salicin; and no liquefaction in gelatin. A swab taken from the operation incisions in the breast showed organisms of the same type. The Widal reaction of the blood-serum gave a positive agglutination to *typhosus* O in dilutions of 1–25 and 1–50. The agglutination was completely negative to *typhosus* H, paratyphoid A, B, and C, and *Brucella abortus*. The serum was further put up against suspensions of—

Bact. aertrycke (O sp.) ..	Slight positive agglutination in dilutions of 1–25 and 1–50.
Bact. aertrycke (H sp.) ..	Gave similar results.
Non-specific salmonella..	Positive in dilution of 1–25.
Bact. gaertner	Positive in dilutions of 1–25, 1–50, 1–125, and 1–250.
Bact. newport	Slightly positive in dilutions of 1–25 and 1–50.

All the other dilutions gave negative results.

The bacillus obtained from the blood was put up against the sera of *aertrycke* O and H, non-specific salmonella, *Gaertner* (H), and *newport*, all with completely negative results. From these investigations it was clear that the organism was *B. fæcalis alkaligenes*.

The husband was a pig-breeder who maintained a fairly large stock of pedigree pigs. In his herd there had previously been outbreaks of what were veterinarily termed infectious necrotic enteritis, swine-plague, white scour, and abortus fever. One of us had the opportunity of examining the premises and carrying out a few more investigations there. The pig-fold was an oblong structure with the pig-sties arranged around the sides. The conditions found were exceedingly primitive and showed gross neglect. The manure from the pigsties had been allowed to accumulate in the fold for many months and the liquid part to drain away as best as it could. The pigs were in very poor condition and many showed extreme malnutrition. The domestic water-supply came from a shallow well which was situated close to a corner of the pig-fold. It could not possibly escape gross contamination from the fold. Three weeks after the patient had been admitted bacteriological examination of the well water showed:—

Number of organisms capable of growing on agar at 37° after two days' incubation ..	2,220 per c.cm.
Number of organisms growing on agar at 22° C. after three days	10,200 ,,
Probable number of *coli aerogenes* organisms in 100 c.cm. of original water	900.

No. *B. welchii* were isolated, and no *B. fæcalis alkaligenes* found—a somewhat surprising finding in view of the conditions—but examination of the sewage from the fold showed the presence of *B. fæcalis alkaligenes*. In addition we were able to examine one of the young pigs. The intestines though free from visible lesions contained numerous large round worms and cultures taken from the ileum gave growth of *B. fæcalis alkaligenes*. Those from the cæcum and spleen were negative.

The gross contamination of the domestic water-supply in this case might be put forward as a possible source of the infecting organism, though the bacteriological examination of the water did not reveal it. The presence of the organism in the normal intestine has also to be remembered. Investigation has shown the presence of *B. fæcalis alkaligenes* in 19 per cent. of a total of 386 healthy soldiers and in 71·5 per cent. of 126 who were suffering from catarrhal conditions of the bowels. The relatively lowered resistance of the bowel during the puerperium might allow easier access to the invading organism.

Muir[6] states that the organism in question is apt to appear in the intestinal flora in the later stages of bacillary dysentery and disappears as recovery takes place. He points out that the evidence is suggestive that these organisms are pathogenic entities which may be responsible for diarrhœal conditions in young subjects and in adults.

Although the clinical symptoms in these cases are fairly severe the mortality-rate is apparently low and the condition seems to respond well to general treatment. The organism seems to have little or no effect on animals inoculated with it. Association with pregnancy has been noted in other cases, and it was presumably a factor in this case. The patient made a complete recovery and so far there has been no suggestion of recurrence.

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EAST GRINSTEAD'S NEW HOSPITAL.—This new hospital, which is being erected at a cost of £24,000, will be completed and equipped by the New Year. It replaces the existing cottage hospital which has become too small for the needs of the district. Princess Helena Victoria has promised to perform the opening ceremony.

REVIEWS AND NOTICES OF BOOKS

Head, Heart and Hands in Human Evolution

By R. R. MARETT, M.A., D.Sc. Oxon., Rector of Exeter College, Oxford. London: Hutchinson's Scientific Books. 1935. Pp. 303. 10*s.* 6*d.*

OUT of his wealth of experience and learning and in a most agreeable manner the Rector of Exeter College has here put together a number of essays and addresses on the thoughts, habits, and accomplishments of primitive man as revealed partly by the study of prehistoric remains and partly by the current life of savage peoples. The tale he tells so well is of great interest, and readers will be tempted to go further than he does—to link what he says with the doings of animals on the one hand and our own vagaries on the other. They will do so with profit, for running through his descriptions and comments are two main theses—that we must take curious actions as we find them and judge them by their intentions rather than by their apparent effects, and that natural man is not a practical fellow but a mystic with whom moral values weigh more than what our sophisticated scale counts as material advantages. As far as we may judge it, the life of palæolithic man or of the Fuegians may seem to be hardly tolerable; yet, as Dr. Marett shows, they knew how to make it worth while by play and fun and by an intimate contact with a spiritual unknown. Clothes did not start with a liking for being warm but with a fancy for dressing up, dancing is an anticipation of civilised litanies, and through it all is a passion for friendliness. Our only regret is that some parts of the book are not more amply treated, especially in the last section on arts and crafts, where we learn, e.g., that the principle of the Diesel engine was known long ago to wild men in Indonesia. What too is the real rationale of the peculiarly human habit of cooking food? More time and trouble are perhaps consumed on that occupation than on any other human activity, but no explanation of why we do it is wholly convincing and satisfying: possibly it is for the fun of making a fire, or is it to denature the proteins?

La vaccinothérapie dans l'asthme bronchique

Ses Indications. By FEDERICO NITTI, l'Hôpital Bichat et le Service des Vaccins de l'Institut Pasteur. Paris: J. Peyronnet et Cie. 1935. Pp. 141. Fr.12.

THIS is a critical and readable essay on the value of vaccines prepared from the sputum in the treatment of asthma, and though it is based on a slender personal experience it is supported by a good bibliography. Dr. Nitti believes that respiratory infection is common in asthmatics and that it is an important factor both in the initiation and the prolongation of the disease. He considers it unlikely that the proteins of the bacteria act as irritants, to which the patients react in the same way as they react to pollen, dander, or similar allergens, for skin tests show that asthmatics are not more sensitive to bacteria isolated from the respiratory tract than are chronic bronchitics or normal individuals; and moreover very much stronger skin reactions can be obtained with organisms such as the typhoid bacilli, which certainly have nothing to do with the disease. The explanation is rather that the chronic bronchitis acts as an irritable focus, which favours the occurrence of the paroxysms, and is also perhaps responsible for the persistent dyspnœa and other pulmonary phenomena which may remain between the attacks. On this account vaccine treatment is of value only in asthma complicated by bronchitis, and the patient remains a potential asthmatic even though the respiratory infection becomes quiescent. The respiratory flora of asthma is identical with that of chronic bronchitis, and is remarkably constant even though the condition is improved by vaccines. In the sputum *Streptococcus hæmolyticus* and *viridans* and pseudo-meningococci predominate; in the nasal secretions the staphylococcus is the chief organism. It is essential that the sputum should be obtained fresh during or just after a paroxysm, and it is best for it to be expectorated in a sterile Petri dish at the laboratory itself. Details are given of the mode of preparation of the vaccines and the frequency and size of the doses, which are injected intradermally. Of the author's small series of patients two-thirds were much improved. The writing throughout is so modest and disarming that many readers will doubtless be inspired with fresh enthusiasm for the vaccine treatment of asthma, in spite of a lurking suspicion that the therapeutic action of vaccines in any bacterial infection still awaits a convincing demonstration.

Recent Advances in Diseases of Children

Third edition. By WILFRED J. PEARSON, D.S.O., M.C., D.M., F.R.C.P., Physician in Charge of Children's Department, University College Hospital; Physician to the Hospital for Sick Children, Great Ormond-street; and W. G. WYLLIE, M.D., F.R.C.P., Physician to Out-patients, Hospital for Sick Children, Great Ormond-street; Physician to the Hospital for Epilepsy and Paralysis, Maida Vale. London: J. and A. Churchill Ltd. 1935. Pp. 566. 15*s.*

THE series to which this volume belongs is one which has led us to expect a high standard of scholarship and a comprehensive review of the most recent work on the subject dealt with. Pædiatrics is perhaps a rather wide field for satisfactory survey in a book of this compass, but in comparison with its fellows this work is somewhat disappointing. A great deal of matter has been included which is too elementary and at the same time too irrelevant to justify the title "recent advances." Whilst any progress in medicine is admittedly based on a sound knowledge of physiology, this hardly appears the place for a rather tedious and not very original recapitulation of elementary biochemical principles. Similarly, some at least of the clinical descriptions, though unimpeachable, might equally well have been written in 1900 as in 1935. It is only fair to say, however, that the authors would admit this freely; their aim has been to give "a connected outline of the diseases of childhood, emphasising modern conceptions of pathogenesis and recent advances in treatment." Its appearance in a third edition, which has been considerably revised, particularly the chapters dealing with diabetes and immunisation, shows that there is a considerable demand for a book of this character, and if too scientific an approach is not expected, the reader will find much of interest in it. The chapters dealing with the diseases of the chest and of the nervous system seem to us the most useful. Some of the statements made with regard to diathesis f various types are based on rather nebulous data nd will hardly find general acceptance. The production of the volume is uniformly excellent, and he publishers are particularly to be congratulated n the large number of radiograms they have been ble to include.

Infections of the Urinary Tract

By T. E. HAMMOND, F.R.C.S., Surgeon to the Royal Infirmary, Cardiff; Consulting Urologist, the Welsh National Memorial Association. London: H. K. Lewis and Co., Ltd. 1935. Pp. 250. 10*s.* 6*d.*

A LARGE portion of this book is devoted to an exposition of the author's views on the nature of infection, in an attempt to correlate infections of the urinary tract with those occurring elsewhere in the body. Mr. Hammond believes that the type of disease occurring in any individual depends as much on the constitution of that individual as on the nature of the infecting organism. He recognises two main classes of abnormal constitution, the hypersthenic and the hyposthenic. The former reacts vigorously to infection, being liable to staphylococcal disease; the latter is said to be more subject to infection with *B. coli*, with a tendency to a poor reaction and chronicity. Stress is laid upon the reactions of the individual to therapy as well as to infection. The author claims that the drugs used as urinary antiseptics act not on the invading organisms but on the tissues of the patient, stimulating their defence mechanisms. Hexamine and the ketogenic diet are thus both believed to exert their favourable effect by direct action on the cells of the central nervous system. The descriptions of the various forms of infection of the urinary tract are clearly the result of a wide experience in urology, and the theories propounded in this book, though unorthodox, are the outcome of much thought devoted to the problems of infection.

Lactobacillus Acidophilus

Its Therapeutic Application. By LEO. F. RETTGER, Ph.D., LL.D., Professor of Bacteriology in Yale University; MAURICE N. LEVY, M.D., LOUIS WEINSTEIN, Ph.D., and JAMES E. WEISS, Ph.D., Research Fellows in Yale University. New Haven: Yale University Press. London: Humphrey Milford, Oxford University Press. 1935. Pp. 203. 11*s.* 6*d.*

THOSE who are specially interested in sour milk therapy will welcome this book. It begins with a series of chapters dealing with the various types of lacto-bacilli and the influence of temperature and other important factors on the growth of the organism. The authors make quite clear the extreme difficulty of isolating the various members of the group, and indicate many points on which precision is impossible even to-day. They are also at pains to show how easily the viability of acidophilus milk can be affected by various adver [illegible] influences and how often therapeutic results [illegible] appoint owing to a diluted or delicate [illegible] mployed. It is to be noted that the [illegible] quart daily of a highly viable acidop[illegible] the necessary minimum dosage i[illegible] are to be obtained. About the type of case [illegible] is likely to benefit from sour milk therapy the authors are rather vague, but apart from somewhat ambiguous conditions such as chronic intestinal stasis they appear to consider that it is in mucous colitis and non-specific ulcerative colitis that the most promising results are secured; 75 per cent. of cases of mucous colitis improved notably but the symptoms appear to have returned in all of them as soon as the milk treatment was discontinued. Less unsatisfactory results were obtained in chronic ulcerative cases; in seven out of eight of such cases the diarrhœa, mucus, blood, and pus disappeared, and although constipation followed cessation of the treatment there was no return of the more alarming symptoms.

We confess that admiration of the fairness and detailed work of the authors of this volume is tempered by disappointment at the very modest claims which they are able to make for a remedy which has interested the public and the profession now for a great number of years.

Manual of Medicine

Fourth edition. By Sir STANLEY WOODWARK, C.M.G., M.D., F.R.C.P., Physician and Lecturer on Medicine, Westminster Hospital; Senior Physician to the Royal Waterloo Hospital. London: Humphrey Milford, Oxford University Press. 1935. Pp. 619. 15*s.*

THIS book is intermediate in size between a text-book and a synopsis, and its style varies from a clipped prose to frank notes and enumerative lists. It doubtless serves a very useful purpose, purveying information to the student whose time is short or who lacks the capacity for making his own notes from a larger text-book. When so much material of varying importance is compressed into so small a space, the perspective is distorted and a proper and graded distribution of emphasis becomes impossible. This is particularly noticeable when treatment is being described. Apart from this limitation, imposed by its nature, the book follows fairly well the lines of accepted teaching, and has been brought up to date. Surprises, however, are not difficult to find, such as the statement that chronic gastric ulcer is commonest in males between 30 and 60 and that alcoholism probably plays a part in its causation, and the further remark that it is "almost invariably" situated at the pylorus. There are a few simple and useful illustrations, chiefly neurological, and a section on insanity is included.

Play in Childhood

By MARGARET LOWENFELD, M.R.C.S., L.R.C.P., Co-Director, Institute of Child Psychology. London: Victor Gollancz Ltd. 1935. Pp. 345. 8*s.* 6*d.*

THE approach to child psychology—normal and abnormal—has till recently been a twofold one. On the one hand there have been the laboratory researches into intelligence by tests, and close observational work of the child mind in action. The classification of clinical disabilities has been unproductive, but psychopathology has opened a new horizon in that it stressed the infantile origin of neurosis and the phantasy life of the child. It was soon seen that while psycho-analysis would reveal mental mechanisms in adults by free association, similar mechanism in children could only be revealed by free play activity in which phantasy was in operation and through which the child played out its experiences and its attitude to its environment. [illegible]hile admitting th the play technique had its true origin in the wo of such analysts as Hug Hellmutt, Anna Freud, and Melanie Klein, Dr. Lowenfeld has worked out a technique of her own, and this volume attempts to give an account of the method and of its findings. The volume is very liberally illustrated with case material and shows the author's enthusiasm and faithful clinical approach. The fascinating "worlds" that children erect in their sand trays are described and interpreted, and the author for the sake of clarity has described the child's activities with phantasy play, and play as repetition of experience, as realisation of environment, and as preparation for life. Those who have similar experience of child play in normal and abnormal subjects will be at one time astonished at the author's daring and at another amazed at her reserve in not going deeper into some of the reactions she records. The analysts will itch to make further interpretations, and the laboratory type of observer will shrink from some of her deductions. But the book is sufficiently documented to reward careful study, even by those who will feel that the author falls between two stools.

1. Patient and Doctor

By Sir HENRY B. BRACKENBURY, M.D., LL.D., M.R.C.S., Vice-President (late Chairman of Council), British Medical Association, &c. London: Hodder and Stoughton. 1935. Pp. 280. 5s.

2. The Doctor and the Public

By JAMES PETER WARBASSE, M.D. New York: Paul B. Hoeber, Inc. 1935. Pp. 572. $5.

1. HERE are two books dealing with the relationship between patient and doctor. Sir Henry Brackenbury begins by tracing the development of medicine through its three phases, the magical, the rational, and the scientific. He discusses the present outlook of medicine which, in addition to its previous two aspects, the curative and preventive, has now added to itself a third, namely, the constructive or perfective aspect. There follows a useful chapter on what the doctor and patient may reasonably expect of one another and the importance of mutual confidence and coöperation to defeat a common enemy is emphasised. The relation between the State and the doctor is next considered. In this chapter the organisation of the medical profession, the essentials of a medical service, and the present systems of State medical provision are described and evaluated. The author regards as inevitable the increasing intrusion of the State into medicine. "The greater concern of the community not only with its own collective health, but also with the personal health of all the individuals who compose it, is not a matter to grumble about but to welcome." The general practitioner must take his share of the increasing (and, may we add, often uninteresting ?) work of preventive medicine. A chapter is devoted to the work of the various kinds of hospitals, their medical staffing, and their relation with the profession outside. Some simple and admirable measures for increasing the comfort of hospital in-patients are suggested. There is a chapter on trained helpers and unscientific healers. Sir Henry Brackenbury has nothing very new to say about the latter, but perhaps does not allow duly for the chief reason that they exist at all, which must be not so much a primitive human craving for magic and mysticism as the all too frequent lack of therapeutic satisfaction obtainable even now from orthodox medicine. If our therapeutics were more effective, surely the raison d'être of the unscientific healer would disappear. The last two chapters deal with the training of a doctor and the future of medicine. No fault can be found with the type of doctor the author wishes to produce. The worst that could be said of the young man who possesses "previous equipment, assiduity and character," would be that he might prove to be a dull dog. Might not a certain liveliness and even humour be added with advantage to counterbalance his more solid qualities ? Visualising the medicine of the future as a social service, the author pictures the general practitioner as one of a team, preferably its captain, ministering to the requirements of the patient, who is not only a biological organism but also a human personality and a unit in a social system.

This book is everywhere interesting and clearly written. On controversial matters the author has been at pains throughout to put the whole case with scrupulous fairness before giving his own views.

2. Dr. Warbasse's approach to the subject is rather different. He is primarily concerned with the historical development of modern medicine and the status of the physician. Starting from the origin of medicine as manifested in animal behaviour, he traces its course through the age of magic to the age of science which began in Ancient Greece. He describes how medical science was kept alive by a few thinkers in the Middle Ages, and the steady advances it made during the sixteenth and seventeenth centuries. Medical progress in the eighteenth century was hindered by the growth of fads and cults, but, in the nineteenth, a scientific age developed a medical culture. Turning to the present, Dr. Warbasse has something to say on the difficulties of maintaining a high code of medical ethic in a competitive world. In his view the doctor must be rendered financially secure if he is to give his best service to the community. Pleading for more doctors, Dr. Warbasse raises once again the vexed question of the periodic medical overhaul by means of which earlier diagnosis of serious disease is to be attained with better prospect of ultimate arrest or cure. Against this might be argued the risk of increasing anxiety neuroses in a world already too full of fear of disease. As every practitioner knows, much professional time is already spent in trying to reassure cancerophobic patients, and one is tempted to wonder whether the sufferer from an incurable disease such as chronic nephritis might not be happier if it were not discovered at an early stage. Dr. Warbasse's book is written in the ingenuous, almost "popular," manner of many similar ones coming from the United States.

Manuel de sérologie pratique

By ÉDOUARD PEYRE. Paris: Librairie Félix Alcan. 1935. Pp. 271. Fr.20.

THIS little book gives an account of the usual serological methods employed in the laboratory. It includes not only immunological procedures, but also such chemical methods as the estimation of sugar, cholesterol, chlorides, calcium, &c., in the blood. A short account is given of the refractometer as a means of studying serum. On the other hand, it omits phosphatase determination, sedimentation-rate, and methods of examining the cerebro-spinal fluid. The descriptions of the methods are easy to follow, but they are not always those which would be used in this country.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 28, 1935

PLASTER-OF-PARIS

"It were good that men in their innovations would follow the example of time itself," says Bacon, "which indeed innovateth greatly, but quietly and by degrees scarce to be perceived." Advance in most things human is however so gradual a process that change is upon us before we realise that it has taken place. Surgical advance is no exception. Mr. Pridie's articles on plaster technique, which appear in this and last week's issues of The Lancet, draw attention to one such development which has within the last five years altered the whole face of fracture treatment. It is hardly too much to say that plaster-of-Paris, in one form or another, has to-day superseded all other fixation splints, be they of wood or metal, and that the modern surgeon employs two types of apparatus only—plaster splints, and skeleton splints for use with weight traction. The methods which Mr. Pridie describes are the outcome of the experience of the orthopædic department of the Bristol Royal Infirmary, and have been standardised for that institution. They differ in detail only from those which are now in common use in every organised fracture clinic in the United Kingdom.

Plaster-of-Paris provides not only the cheapest but the most efficient method of external splinting. It requires neither a large stock nor an elaborate variety of apparatus, for by its employment all types of splint can be made, any number of the same kind can be duplicated, or new ones devised for every conceivable purpose. There is no storage problem, for splints are made when required, and thrown away when no longer needed. A well-made plaster splint is stronger, lighter, and more comfortable than one constructed of any other material. But its chief recommendation is its incomparable efficiency as a means for controlling the position of the limb which it encloses. For a plaster splint is an individual thing, fitting the part upon which it is moulded in every detail. Stock splints of wood or metal, however great their variety, can never be more than an approximate fit. Long bones are curved, splints are straight. Limbs vary infinitely in length, diameter, and contour, and in the relative proportions of their segments; splints can only be graded to a finite extent, and permit of a limited variation in the position of the joints adjacent to the injured segment. To make it fit and keep it comfortable a stock splint must be padded, and padding means the employment of a yielding structure which is incompatible with complete control. The well-designed plaster splint maintains position by its perfect adaptation to the limb, and not by pressure or traction. The reasons for the pre-eminent position of plaster-of-Paris to-day require no elaboration, but it is interesting to speculate why the method, which was old 4000 years before Christ, and which was apparently known to the surgeons of antiquity, should only have attained full recognition during the last five years. Why are fixed splints still made and sold; why are new ones devised from time to time; why is plaster-of-Paris still so little used outside the hospitals and fracture clinics? Many factors have undoubtedly contributed to this tardy recognition. Plaster-of-Paris, as is well known, must be blended with some fibrous material to be efficient as a splinting medium, much as concrete is reinforced with a core of metal strips. The older methods of plaster work made use of felt or house flannel for this purpose; accurate moulding was difficult and failures frequent. Perfection in method has come with the development of the plaster bandage, that protean unit that can be used in so many ways. But while good plaster work has been made very much easier by improvements in materials, it still remains an exacting art, demanding not only some experience and natural aptitude, but space, time, and skilled assistance. Lacking these last three, the busy worker is often obliged to use ready made splints in spite of their disadvantages. First-aid work and temporary immobilisation will always demand some readily applied apparatus.

The perfect plaster splint must retain the limb under all conditions in the desired position with complete comfort. It must be strong yet light, effective in use but easily removed when it is no longer required. It must therefore be planned upon engineering lines. The greater part of it is a retentive shell, which need only be thick enough to withstand chance blows, but it must be reinforced at its edges and buttressed where it is subjected to special stresses. Places that are too thin will weaken the whole; unnecessary thickness means unnecessary weight. Not only must it be well designed but it must be homogeneous, plaster and gauze being uniformly incorporated throughout, so that no trace is seen in section of its component layers. If part of the bandage is applied too dry, it will not set; if moistened too early, it will set prematurely and fracture on application. If one layer is set before the next is applied, or if successive layers are not well rubbed in, air spaces will appear and strength will be lost. The perfect plaster splint requires not only perfect technique but a perfect bandage. Every orthopædic surgeon is well aware that the making of such bandages is in itself an expert's job. The plaster-of-Paris must be of the finest quality, freshly prepared, and kept air-tight. The muslin must be fine enough to retain the powder, yet not so fine as to hinder the permeation of water. The powder must be rubbed in slowly by hand, not too much and not too little, and no lumps must be incorporated. The bandages must be rolled s loosely that they will take up water at on When made they must be stored in air-tight t and those tins must not be disturbed till the bandages are required, or the powder will shake out and accumulate in the bottom of the tins. The making of these bandages is a laborious, but highly skilled task, and it will often happen that, when a nurse who has been doing the work has been moved to a new post, the fracture work of a hospital may suffer for a whole month till her successor has acquired the necessary skill. One great advance, which has made uniformly good work possible to those who have the patience to learn the technique, is the introduction of the modern proprietary plaster bandage. Ready made bandages have always been obtainable, but these have till lately been inferior to the best of the hand-made ones, the chief fault being that the gauze upon which they were based has been too thick and rigid to permit that accurate moulding to the contour of the limb upon which success depends. The modern bandages have all the advantages of the hand-made article, with others of their own. Their quality is constant, and they keep indefinitely without deterioration. They absorb moisture more rapidly than hand-rolled bandages, and set firmly in less than ten minutes. When set they are stronger yet less brittle than ordinary plaster; the surface is hard polished and non-absorbent, the trimmed edges do not crumble, and casts made from them can be bisected, or cut open and sprung apart, without loss of strength. A splint made with this is thinner, lighter, and more durable than one of equal strength made from the best hand-rolled bandages. Perhaps the most striking advantage to the surgeon is the manner in which the plaster is incorporated with the bandage; this makes the construction of a splint a very much cleaner job, for no powder gets loose on the table and floor, and a more economical one, for small strips and bars can be cut out beforehand, moistened, and laid on at points of stress to reinforce the completed splint.

Plaster-of-Paris technique has culminated in the development of the unpadded plaster case, a method of fixation which we owe to Lorenz Böhler of Vienna. The unpadded case is the basis of modern fracture treatment; it is not merely an improved application of an old technique, but the expression of a physiological ideal. To the anatomical mind the aim of fracture treatment is the reconstruction of the bone in its former length, alignment, shape, and structure; to the physiological mind it is the restoration of the injured limb to its former function, taking into consideration not only the bone, but the joints, muscles, circulation, and innervation of the damaged segment—and the mentality of the patient. The ideals of form and function have been at variance throughout the ages; form has asked for splinting, fixation for movement. Many of us have seen the evil results of prolonged or excessive fixation, but only those older surgeons who are familiar with the results obtained by Lucas-Championnière and his disciples are aware of the ghastly failures for which the early movement school has been responsible. Movement of repair tissue leads to injury, injury calls forth hyperæmia, and hyperæmia in turn brings decalcification and deficient bone formation; on the other hand, complete rest leads to a decreased circulation, stiff muscles and joints, and the formation of avascular and sclerosed bone. It has remained for Böhler to point out the ideal, which is use of the injured part without movement of the injured structure. By such means the circulation is maintained at its normal level, neither deficient nor excessive, bone repair proceeds at its optimum rate, while the muscles and joints maintain their circulation and retain their movements. This ideal can only be reached by the use of a plaster case, accurately fitted to the surface of the limb and the contour of its bony points, which combines complete immobilisation with entire comfort. But the unpadded case is only successful if it is faultlessly applied; the chief danger is constriction of the limb, the commonest cause of failure the development of pressure sores due to wrinkles on its inner surface. Such sequelæ are usually due to some error, such as the attempt to alter the position of the limb after the case has been put on, and they will be avoided by careful study of Mr. Pridie's instructions.

The immensely improved results which are being obtained to-day in Colles's fracture and fractures of the tibia and fibula by this method of functional use of an immobilised segment are known widely enough to need no eulogy. Böhlerism has come to stay. Plaster-of-Paris reigns supreme.

THE PASSING OF OTORRHŒA

The frequency of discharging ears is not a bad index of the efficiency of medical care in any community. Some twenty years ago a mother brought one of her children to an out-patient department in a poor district of London complaining that, although the child was teething, there was no discharge from the ears, as had been the case with all her other children. Otorrhœa was in fact appallingly frequent before the medical inspection of school-children was instituted in London thirty years ago, and indeed until an efficient organisation for the treatment of these cases was gradually evolved some ten years later. But only a few of these cases attended hospital and then very irregularly; in the intervals the children were left to the care of their mothers, who were quite incapable of keeping the ears in a wholesome condition. Most of them were in consequence in a very offensive state, and the smell of an elementary class-room was often disgusting; no one who has not experienced it can imagine what it was like. And yet chronic discharge from the ears is preventable. If treated correctly from the beginning, the majority of cases of acute suppuration heal with intact drum and restoration of function; while most of those that persist can be cured by timely operation on the mastoid.

In London the campaign against otorrhœa began with the organised treatment in the schools under the control of the London County Council, the story of which is told in the school medical officer's report[1] for 1934. About 1909 district nurses were first employed to visit affected children in their homes. Although the ears were thus kept in a more hygienic condition, the method was not satisfactory; the cost per case was considerable, the nurse wasted much time in visiting a home often to find that the child was out, and the work was not under medical direction. Four years later "minor ailment departments" were introduced at school treatment centres, where the district nurses worked under medical supervision; these have been gradually increased in number until there are now 70 covering the whole of London; this led to a great improvement in the conditions, and got rid of the offensive ears altogether. The doctors in charge were not, however, specialists in otology, and the departments tended to be clogged by uncured cases. An "ear inspection clinic" was then arranged, to which were referred cases from the surrounding minor ailment departments. In-patient treatment was also secured for those whose cure could only be expected from mastoid operation or other in-patient treatment. This clinic proved to have great possibilities and the system was gradually extended to other areas; an aural surgeon of experience was appointed to each, and in 1920 zinc ionisation was added to the routine of treatment. At first cases from the minor ailment departments which did not clear up after three months' treatment were sent to the special clinics, but in 1925 it was arranged that all cases which had not recovered in one month should be so referred. This is a point of the utmost importance for it enables the children to receive expert attention at the most critical period of the disease. In the early years treatment by operation was greatly hampered by the long wait for hospital beds, but this difficulty was surmounted by the provision of adequate accommodation by the Metropolitan Asylum Board, and more lately at the L.C.C. special hospitals. Children on leaving hospital now receive after-care at a special centre.

Figures given in the report show the success of this work in reducing the frequency of otorrhœa; thus in the period since 1911, covering the twenty-five years of His Majesty's reign, the percentage of children suffering from discharging ears has fallen from 3·7 to 0·9. Nevertheless in the year 1934, 4200 discharging ears were observed, of which 2261, or 53·8 per cent., were cured; 1271 of these were old cases returning for observation, showing that relapses are still occurring. These figures relate to ears, not patients, the proportion of cases cured being 70 per cent. or more. Despite this enormous improvement much remains to be done; there is still far too much otorrhœa among the children of our county schools. The best prospect of further improvement probably lies in paying greater attention to acute otitis in its earliest stage. Since the child with earache is kept away from school, the chief hope of progress is to be found in enlisting the interest of the family doctor and in educating the public in the importance of early treatment.

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[1] L.C.C. Annual Report for 1934, vol. iii., part 2.

FORCEPS HEAVY AND LIGHT

THAT obstetricians do not practise what they preach is the conclusion drawn by Mr. WRIGLEY from the study of the case records of "one of the leading maternity homes in London" (see p. 702), a study presumably undertaken in order to confirm or refute an impression gained from other less definite evidence. The patients in the nursing-home to whose records he had access were for the most part under the care of teachers of obstetrics. Mr. WRIGLEY has ascertained that delivery was completed by forceps in as many as 203 of the last 300 consecutive cases (primiparæ) admitted. On their face value these figures certainly support his thesis that it is likely to be more profitable to find some way of reducing the risks associated with the application of forceps than to attempt to stop their use. He contends that the powerful but dangerous instrument now in vogue was designed and constructed to enable the accoucheur to deal with a woman "whose pregnancy had had no supervision and in whom obstructed labour had occurred, the fœtal head having failed to descend in the pelvis." And we agree with him that to-day such disproportion would stand a far better chance of being discovered either during pregnancy or early in labour, when Cæsarean section rather than forcible delivery would be performed. Nowadays delay in labour, when it occurs with the head at the pelvic brim or in the mid-pelvis, results generally, as Mr. WRIGLEY says, from incomplete rotation or flexion or a posterior occiput; in such cases the proper course is anæsthetisation of the patient, and a thorough examination to ascertain the cause of the delay, possibly followed by Cæsarean section, rather than hasty application of forceps long enough to reach and grasp the fœtal head and strong enough to haul it out. Reiteration of the potential dangers of such an instrument is, in Mr. WRIGLEY's view, futile so long as the medical student sees it in the hands of house officers for routine forceps delivery of fœtal heads low in the pelvis. His solution is the substitution of a short light forceps for the axis-traction model, being convinced from personal experience, detailed below, that it will meet most of the needs of the doctor and will enable him to shorten labour without risk to mother or child.

In the last 58 consecutive deliveries of primiparæ in his own practice the fœtus presented the vertex. In 23 of them delivery was unaided; in 32 the head was lifted through the pelvic floor with a short forceps weighing less than 10 oz. In 2 of 3 cases where manual rotation of a persistent occipito-posterior position was required the fœtus was delivered easily with the light forceps. In the third the fœtal head did not sink into the pelvic cavity after rotation and the long forceps was applied. Mr. WRIGLEY admits that the 32 women would eventually have delivered them selves; his principle in expediting labour is tl humane one that it is the duty of the attenda to alleviate pain in so far as this is possible witl